

# THE MICROCOSM:

THE ORGAN OF THE

## Substantial Philosophy.

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DEVOTED TO THE DISCOVERIES, THEORIES, AND INVESTIGATIONS OF  
MODERN SCIENCE, AND THEIR BEARINGS UPON THE  
RELIGIOUS THOUGHT OF THE AGE.

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VOLUME VI., 1889.



NEW YORK:  
HALL & COMPANY.  
23 PARK ROW.

82,650

RECEIVED

AUG 11 1894

WIS. HIST. SOCIETY.

Press of H. B. ELKINS, 13 and 15 Vandewater Street, New York.



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# The Microcosm

A MONTHLY JOURNAL OF SUBSTANTIALISM AND COLLATERAL DISCUSSIONS.

THE ORGAN OF THE SUBSTANTIAL PHILOSOPHY.

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(Author of the "Problem of Human Life," "Universalism Against Itself," Editor of the *Scientific Arena*, &c., &c.)

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Address all communications to A. WILFORD HALL, 23 Park Row, New York.

Vol. VI.—No. 1.

DECEMBER, 1888.

50 Cents a Year.

## THE AGE OF ALUMINUM.

BY THE EDITOR.

The most startling scientific announcement of the present century, judging from all its bearings and possible effects upon the commercial, domestic and artistic interests of the world, is that which comes from Germany through a correspondent of the *Chicago Tribune*. It is a matter of no less moment than the discovery of new methods and processes by which the hitherto rare and expensive metal, *aluminum*, can actually now be produced at a cost not exceeding twenty-five cents a pound. At this price it is nearly as cheap as the best steel, bulk for bulk, it being but one-third its weight, while it is vastly superior to steel for innumerable purposes and inferior to it for very few.

In one essential respect aluminum is the monarch of all metals, being more plentiful in nature and more widely distributed through all sections of the earth's surface than all other metals combined. It is an essential component of clay, which is found nearly everywhere, as well as of granite and many other rocks,—good, compact clay, such as is found on almost any farm, having been proved by chemical analysis to contain from ten to twenty per cent. of the pure metal. This fact has been known since its original discovery by Wöhler some sixty years ago, though up to the present time no cheap process for separating all this metal from clay had been discovered. Hence this metal has hitherto been used exclusively for jewelry, almost on a par with gold.

When Prof. Wöhler first astonished the world by extracting a few silvery grains of this then unknown metal from a lump of common clay, little did he suppose that he had inaugurated the most gigantic commercial and civilizing revolution the world had ever witnessed.

Aluminum was then regarded as a metal of no general value, save as an addition to the elemental substances known to science, its enormous cost of extraction from clay precluding it, as supposed, from any general commercial or domestic uses. But in less than a score of years thereafter the same investigator, aided by others, had so cheapened the processes of separating this remarkable metal from its base that it could be obtained about at the cost of pure silver, ounce for ounce, or at a maximum of sixteen dollars a pound.

These successive announcements encouraged later metallurgists whose experiments were constantly rewarded with still cheaper and more expeditious methods of extraction till the apparent climax has, as stated at the commencement, been reached near Cologne, at the town of Essen, Germany, where this hitherto precious metal is being melted out of clay into hundred-pound ingots at not much greater cost than steel bars of

the same size were produced forty or fifty years ago. And judging from these prodigious strides of progress since its discovery, even within the memory of men still living at Essen, coupled with the universal presence of this metal in all the clay-banks of the world, it is but a rational anticipation to expect to see in the near future aluminum hollow bricks, turned out from improved furnaces, of the same building capacity and approximately at as little cost as the best pressed bricks are now produced from the same source.

Aluminum is a shining white metal, with a bluish tint approaching that of platinum, these two metals occupying the extremes of weight in the range of metallurgy, the specific gravity of the former being but 2.6, while that of the latter is 21.5, or about 8½ times heavier than aluminum.

In view of the low cost at which this invaluable metal is now obtained, it is almost bewildering to one's senses to contemplate the possibilities involved in such a revolutionary discovery. Even at the present reported price of its production, should it be obtained no cheaper, there is no reason why iron and steel should not be at once almost entirely superseded by aluminum in the useful and necessary arts. While this almost precious metal is as tenacious, as malleable, and as ductile, when soft, as iron, it becomes as hard as steel when rolled and hammered into tools and implements.

Then, still further and more important, it will not corrode at all, or oxidize under conditions where iron and steel will soon disappear in rust. Its extreme levity, also, must necessarily cause it to supersede steel and iron in every use where the weight of the latter is a detriment, such, for example, as for ships and boats of every description.

Our great ocean steamers when thus formed of aluminum sheathing, while practically indestructible from the action of the elements, would produce but one-third the displacement as when formed of iron, thus proportionately increasing their tonnage or carrying capacity, or, with the same cargo as now enabling them to traverse waters comparatively shallow and with vastly greater speed.

The present iron work of all our passenger and freight cars would give place to the stronger, handsomer, and safer metal—aluminum—with two-thirds reduction in weight both for the saving in the wear and tear of the rails and track, and the expenditure of motive power for transportation. The locomotive alone might still require to be made of steel and iron, its weight being needed for traction.

For guns of every description the great tenacity or tensile strength of aluminum would cause it at once to take the place of steel, bronze, or any other metal of like weight, while for ordnance of large

caliber, either for artillery uses on land or for the naval service, the ease with which such large guns could be handled would give the new metal a decided preference,—the projectiles alone still requiring to be made of the weightier metals.

The same distinctive conditions apply also in a marked degree to bridges of every description, where the maximum tensile strength and indestructibility, combined with extreme flexibility and lightness, constitute the essential factors in these now mightiest engineering structures of the world. Spans of enormously greater length and breadth than any that now exist, would gladden the ambitious enterprise of our eminent mechanical and civil engineers, and inspire new projects hitherto deemed impracticable, which would result in numberless advantages in the progress of modern civilization including also in every class of bridges much greater safety to human life.

In the details of domestic and general use, it is impossible to enumerate all the purposes to which the new metal would at once be applied with increased utility. Take, for example, the manufacture of bells of every description from the smallest to the largest sizes,—in which department of manufacture all other metals must at once go out of use, since no other metal compares with aluminum for sonorous properties either in intensity of sound or quality of tone—while its superior levity would permit the hanging of large bells in much higher towers than at present, and of two or three times the size even of the monster bell of Moscow so famed in history.

For electrical purposes, such especially as in the case of suspended telegraph wires, all heavy metals would have to give way, since the conducting capacity of aluminum is nearly equal to that of copper.

In every description also of cutlery and table service, such as steel, silver, and plated wares, aluminum would at once be placed upon the throne and forever after be allowed to reign supreme in harmonious concert with the same beautiful and untarnishable metal wrought into every variety of cooking utensils and kitchen appliances, including stoves, ranges, etc.

Oil-tanks, as well as barrels, casks, and wooden vessels generally now universally employed for holding and transporting wines, liquors, etc., would at once be supplanted by the uncorrodable aluminum, while even bottles, carboys, demijohns, etc., of every variety, and for nearly every purpose, where transparency was not an essential factor, would cease to be made of glass, so easily broken, and would take their places in beautifully polished vessels of aluminum.

Time fails us to speak of the tubular aluminum masts and spars of yachts and other sailing craft, lighter than spruce and stronger than steel, rigged with cordage of aluminum wire rope, and even cables for the aluminum anchors, lighter than hemp and many times stronger than manilla or jute. Of carriages, wagons, and all sorts of land vehicles, even down to handcarts and wheelbarrows. Of chandeliers and every variety of gas-fixtures and ornamental lamps. Of business signs of all varieties, a hundred times more ornate and a thousand times more durable than can be made of wood. Of the revolution that this semi-precious metal must immediately effect in the plumbing of city dwellings and business houses, doing away forever with destructive leaks from the rusting of iron pipes, or with the poisoning of our water supply by the use of pipes of lead, which so often tempt naughty rodents, in their gnawing search for drink, to flood buildings and ruin costly goods. Of aluminum plows, rakes, cultivators, mowing and reaping machines, with other and innumerable varieties of agricultural implements, etc., etc., etc.

But possibly the greatest and most important phase of this aluminum revolution will not be so much in the changed character of the manufactured articles needed and used in civilized communities, as in the changed character of much of the labor, machinery, and productive processes of mechanics and artisans throughout the world. Furnaces, rolling-mills, foundries and manufactories of iron and steel, in all their multitudinous forms and uses, will almost completely be supplanted by mammoth aluminum works for the extraction of the pure metal from the innumerable clay beds of the world, and for the transformation of these rich products into the countless commodities for which the grosser metals are now used, thus raising the laboring classes in the mechanic arts to a plane of dignified employment as much above their present grades of work as will be the queenly metal they shall fashion superior to the crude and cumbersome iron they now handle.

Old as the writer now is, he confidently hopes yet to ride in trains of aluminum palace cars upon our elevated railways, supported by aluminum pillars, and to see glistening about him in this great city magnificent palatial residences of exquisite design and architecture, wrought of variegated, frosted, and illuminated aluminum, as artistic as it will be serviceable, and as indescribably beautiful as it will be imperishable. And, if permitted by the favored owners, he hopes to accompany the reader arm in arm through those gorgeous halls and corridors, and to inspect the sparkling furniture, such as tables, chairs, sideboards, bookcases, picture frames, parlor and bedroom suites, all moulded and carved of solid aluminum, as precious as gold, more durable than silver, and lighter than rosewood.

We congratulate the reader that he has lived to see the beginning of the decadence of the age of iron, and to have entered upon the commencement of the age of aluminum—a fitting prelude to a millennial age, when this corruptible shall put on incorruption, and this mortal shall put on immortality. As the stone age of prehistoric man, in the natural order of things, had to give way to the more advanced age of bronze; and as the bronze age of semi-civilized man had to give way to the present enlightened age of iron; so the iron age of the highest civilization the world has ever seen is about to give place to the age of aluminum, at this very moment beginning to dawn, as the white harbinger of that eternal age, with its New Jerusalem descending from God out of heaven, having her walls of Jasper, her foundations of Sapphire, her gates of Pearl, and her streets paved with pure Gold as it were transparent glass.

#### A NEW EPOCH IN PHILOSOPHY.

BY J. I. SWANDER, D. D.

The advent of Substantialism marked a cardinal period in the calendar of time, and gave birth to a new epoch in the history of the world. In its basic principle it is radically different from anything ever previously discovered by the tireless searches of independent human energy, and publicly exhibited in the crowded museum of the world's important achievements. The past has produced much of great importance, but the principal value thereof consisted largely in its significant prophecy of better things to come. *Rena Descartes* sent up a few magnificent sky-rockets which attracted the attention and secured the admiration of his age; yet Cartesianism was constitutionally ephemeral. It went whizzing and whirring through the heavens of meteoric philosophy.



phy until it gradually settled back upon the earth. It was so high in its transcendental flights as to be entirely inapplicable to the affairs of practical science and the solution of the problems toward which the world has constantly aspired. The vivid flashes of its lightning were never seen except in the clouds where they were liberated; and yet they were valuable in startling the world from the slumbers of its scholastic drowsiness. With Bacon, the French philosopher succeeded in rattling up the dry bones of the Middle Ages, but accomplished very little in a positive and permanent form. Though the Baconian system of philosophy may not terminate as ingloriously as did the life of its founder, it is as far from solving the central and ultimate problems of the world as were the teachings of Anselm and Abelard. In these last times something conservatively similar and radically different was demanded by the peculiar exigency of the unsatisfactory condition into which the learned world has been gradually and unconsciously led by the downward trend of its false philosophy.

The 16th century called for a revolution in the method of reasoning: the 19th required a more true conception of the substance concerning which men were trying to reason, as well as a broader definition of the proper term expressive of all the entities in the universe. A new period in history was called for. Without such a period the human race would soon have been obliged to acknowledge itself as destined to be finally punctuated by the catastrophe of hopeless extinction, so far as the problem of human destiny was susceptible of satisfactory solution in the light of Nature or according to the analogies thereof. Nothing but the material in being was regarded as substantial. Upon this fundamentally false conception of what was really included in entitative being men built their cobweb syllogisms, and reasoned themselves into such logical helplessness and consequent vexation of spirit that Ingersoll, Haeckel, and the yawning grave began to laugh at the apparent calamity which threatened them, and to mock them with torturous derision because of the fear of eternal annihilation which was swooping down upon them like the vengeance of an infuriated whirlwind.

This was the condition of suspense and anxiety throughout the thinking world during the last several decades of its history. This suspense seems to have culminated in the middle of the afternoon of the 19th century. About that time the Substantial Philosophy made its first appearance in the form of *The Problem of Human Life*. Its arrival was of no less importance for the cause and comfort of humanity at large than was the appearance of Blucher's columns upon the field of Waterloo for the salvation and peace of Europe. In each case the tide of battle was opportunely turned, and a new direction given to the current of the world's providential onflow.

The fundamental tenet and teaching of Substantialism maintains that besides the material substances in the general constitution of Nature there are also forms of immaterial substance as real as the adamantine rocks of the earth or the glittering stars of the firmament. It boldly asserts and triumphantly proves by many infallible testimonies of analogical reasoning that the human soul is a veritable substance more imperishable than the sun and no less enduring than the author of its being. The new philosophy shows that this royal charter of man's immortality is written and interwoven in the fibres of this peculiar substance, which came forth from the King immortal in a sense that can not be predicated of mere material substances in any of their manifold forms. ♦

So radical and revolutionary is the Substantial

Philosophy, and at the same time so conservative in its advocacy of all well-established facts in science and religion, that good men are receiving it with emotions of mingled hesitancy and admiration. The sober second thought is frequently required before its fascinated and cautious disciples are willing to spread the wings of their rational faith and fly like doves to the open window of the Substantial ark. Like most of the great systems of truth brought in by the birth of other new epochs, it has come to man in a paradoxical character; yet so thoroughly are the thinking men of the age becoming disgusted and disheartened with the false reasonings of exclusive materialism that they are now ready to throw aside a ton of popular nonsense for just one ounce of well-established truth upon which to pillow their heads in rational confidence when called to pass through the valley of the shadow of physical dissolution.

Fremont, Ohio.

## EVOLUTION—NATURAL SELECTION.

BY THE EDITOR.

The Darwinian theory of evolution, by which it is claimed to give a scientific and rational explanation of the origin of species, teaches that the habits, instincts, and mental powers of all animals from the lowest living forms to the "human form divine," have come into existence by a law known as "natural selection and the survival of the fittest."

Not only the mental faculties and modes of life of the innumerable animal tribes and species were thus produced, according to modern evolution, but their very forms and the relations of different animals to each other, were also the direct results of this natural law in adapting such varied specific forms of existence to their environments.

But with all the approximate similarity in organic structures, and the partial resemblances which exist in the habits and instincts of allied species, the advocates of this system of development and even its originators admit that there are numerous difficulties encountered in making application of the theory which defy human ingenuity and research to explain.

Mr. Darwin, in his "Origin of Species" and in his later works, frequently runs upon such difficulties, and more than once has exclaimed in his candor: "Any solution of this difficulty, however improbable, would be acceptable." Mr. Darwin, however, never seemed to think that all these evolutionary difficulties would at once be met and wiped out by the very solution he was forced to apply to his own initial problem, namely, the origin of the *first few simple forms of life* by which he admits evolution to have got its start. He there saw that his law of "natural selection and survival of the fittest" could not act at all without created forms on which to act—that there was nothing to "select" from, and nothing to "survive," unless animal forms should first exist and commence to vary so that selections might begin and the fittest might thus be preserved. Hence, with his intrinsic and proverbial honesty, Mr. Darwin saw and confessed that these first simple forms of animal life had to be created by special acts of an allwise intelligence.

We are aware, however, that Mr. Darwin did this grudgingly even to intense reluctance; for he saw the pit it must forever after leave open in front of his theory at every step of its progress. Plainly, said Mr. Darwin to himself, if the first forms had to be produced by the special and miraculous acts of an allwise Creator, what greater tax would it have been on infinite power and wisdom thus to create each specific form as it

was needed in the development of the earth's surface suitably for its environment? If the "first few simple forms" of animal life could come into existence, completely adapted to their environment and fitted to survive, without the slightest aid from the law of "natural selection," why, Mr. Darwin naturally reflected, could not that law have been entirely dispensed with so far as it was required to originate different specific forms?

We frankly admit that we can see how such a law might be useful in developing a species of animals to greater perfection or suiting it more and more to its environment as the earth's surface might undergo natural changes. All this we can freely concede after the species had once been created by the divine fiat. But we fail to see any intrinsic use in a law of natural selection as a creator of animal species when it was entirely unnecessary and impossible in the construction of the "first few simple forms."

Indeed, a system of divine procedure which would be so totally incongruous as to make the first few forms or species of animals by direct creative acts, and then relegate exactly similar results of creation in the future to a blind, unintelligent, and irresponsible law of nature, and by a process to which the original acts of creation could bear no comparison or resemblance, would be to invite the ridicule of man's intelligence as soon as such intelligence should chance to develop from these "first few simple forms."

But why harp continually upon "simple forms," as does the author of the "Origin of Species"? Evidently Mr. Darwin, in his desperate attempt to give evolution a start (since his "law of natural selection" could only act upon specific forms after they should exist), thought he would make it as easy for the "Creator" as possible in giving this start, leaving the brunt of the labor and the more difficult task of constructing the complex forms of the higher organic species to a wonderful law that he (Darwin) himself had discovered.

Mr. Darwin must have said to himself—"Now, if I can only make the impression that these first created forms were very 'simple,' and consequently required but very slight intelligence on the part of God to originate them, I can almost cover up the idea of a 'Creator' entirely; and after a little, by extolling the marvelous power of this new law of 'natural selection,' I may hope to make the reader forget entirely that I had admitted the necessity of a Creator for those first forms, especially if I can only *simplify* them enough at the start!"

Poor Darwin! Never, perhaps, since books were written did a great scholar and scientist suffer such mental torture over the absolute necessity of avoiding the use of any particular word, and then be obliged to use it, as did Mr. Darwin over that word "Creator." Yet it never seemed to occur to that amiable and versatile investigator that it would have been just as easy for an *infinite* "Creator" to have made the first few forms complex, such as those of dogs, horses, monkeys, &c., as to have made worms, polyps and monera instead, and thus to have given "Natural Selection" something to go to work on worthy of its wonderful powers. Nor did it occur to that profound thinker that had he put his new law at work first upon a few complex forms it would have had the assistance of another well-known law of nature, namely, that of natural deterioration or the degeneration of species out of which to develop (?) the less complex forms by degeneration or back-action evolution, as urged by Herbert Spencer.\*

\*For an elaborate discussion of this entire question, see the 7th, 8th, 9th, 10th and 11th chapters of the "Problem of Human Life."

Since cave-rats and fishes, as is well known, have lost their eyes entirely through succeeding degenerations of desuetude, it is a much more reasonable and possible supposition that complex forms, had they first been created, could have deteriorated even into worms and mollusks, than to accept Darwin's theory of development of new and complex organs out of his supposed "simple forms."

Prof. Haeckel, the eminent naturalist of the University of Jena, who immediately followed Mr. Darwin's "Origin of Species," in extolling the powers of natural selection, actually ridiculed, in his "History of Creation," the weakness of his great master, though he did it in an apologetic way, for having been so illogical as to admit any necessity for a "Creator" in the construction of the "first few simple forms," and insisted that such inauguration of animal life as natural selection needed on which to begin its work must have been the result of "spontaneous generation out of inorganic matter," thus avoiding all necessity for the interposition of an intelligent "Creator."

Prof. Haeckel even goes so far as to intimate very clearly that Mr. Darwin's secret object in admitting a "Creator" for the "first few simple forms," by which natural selection could make a start, was to curry favor with the English clergy who would have rejected his evolution theory in toto had not the "Creator," in some shape, been recognized in the system. Yet it is a fact that although Mr. Darwin lived many years and wrote many books after this innuendo was published, he never so much as hinted that Prof. Haeckel had done him injustice.

The truth is, Prof. Haeckel represents the only consistent and logical element in the system of modern evolution. Mr. Darwin's view of miraculous creations at the start, however disingenuous that view may have been, and which is now substantially followed by theistic evolutionists such as Joseph Cook and Dr. McCosh, was without the shadow of logic or consistency to support it. To suppose that God wrought a "few" miracles at the inauguration of animal life on this earth, and then retired from the arena of organic development, leaving the future of the inhabitable earth to the chance operations of a mindless law of nature, is a hundred fold more puerile and preposterous than Haeckel tried to represent it. And to assume, as do theistic evolutionists, that after the "first few simple forms" had been miraculously created, God personally supervised every minute variation through millions of organic forms and changes of structure, up to the complex body of man—thus "to avoid the necessity of numerous miraculous creations"—is to perpetrate a self-deception and incongruity as deplorable as it is pitiable.

What is the divine "personal supervision" of the initial change, for example, of the reptile toward the form of the bird, but a miraculous intervention—as much an act of infinite wisdom and power as to have created the perfect bird at a single fiat? Yet, according to Mr. Darwin, it required thousands upon thousands of such distinct variations from the form of the reptile before the first bird was able to fly.

Thus do theistic evolutionists, in trying to avoid the necessity for so many miraculous creations for the various species unwittingly involve themselves and their theory in thousands of miraculous supervisions even in the production of a single species, each one equivalent to the separate creation needed in producing a complete pair of pigeons. How much more logical and consistent would it be to adopt the creation-theory entire for each separate species, than to stultify the attempt to fritter away the Bible account of creation by

involving a million times greater number of miraculous interpositions than were really needed in the economy of God's universe as described in Genesis!

Thus are we again irresistibly driven to the necessity of denying all miraculous creations, even for the origin of life, and with Prof. Haeckel, of proclaiming spontaneous generation in lieu of a personal God, or else forced to abandon the doctrine of modern evolution in all its forms and phases.

As Prof. Haeckel's godless and materialistic evolution is the only system of the transmutation of species that possesses even the color of logical consistency, theistic evolutionists are forced either to deny the existence of God, accept spontaneous generation and thus go over bodily to the German materialists, or else to abandon the entire doctrine of evolution in all its phases, and join with Substantialism in crushing out materialistic science as the chief and only present obstacle to the progress of Christianity.

### ROBERT ROGERS, THE BOY LECTURER.

BY THE EDITOR.

Never before in our editorial work have we published a sketch in which we have felt the interest that we now feel in presenting to the readers of *The Microcosm*, a brief biographical outline of our young friend and associate, Robert Rogers.

For six years he has been in our employ in almost every capacity, from assistant book-keeper and corresponding clerk up to office-editor of *The Scientific Arena*, and now associate editor of *The Microcosm*. During all these years he has been more of a companion than an employé, in which we have learned to know him better than we ever knew any man or boy; and during all these most intimate relations with him, while he has thus acted as our private secretary and confidential clerk, we have gradually grown to love him with all the affection of a father.

Since he first came to our office, more than six years ago, in answer to an advertisement for a boy to assist in writing wrappers, he has steadily grown in our confidence and trust, with an unassuming willingness to aid us while showing an anxiety to improve his mind which gave unmistakable promise of a coming man who would surely make his mark in the world.

At the very start of his office work, as general correspondent, he was brought into contact with the exciting discussions of the Substantial Philosophy which were carried on through letters, and through *The Microcosm*, into which he drank with an avidity and aptitude at which we were surprised no less than gratified.

In numberless conversations on the subject with visitors from near and far, especially with ministers who had become interested in the cause of Substantialism, it was easy to observe that the racy and versatile young correspondent was more than a mere clerk. He proved himself to be a profound observer as well as student of all the discussions carried on; and soon, from his intelligent grasp of the questions involved, he became a participant in these almost daily controversies.

Visiting ministers soon detected this precocious proclivity toward critical scientific discriminations, and involuntarily encouraged his genius and natural bent of mind by referring

to him for solution and elucidation some of the most critical questions of science and philosophy which happened to come up for discussion.

During the fall and winter evenings of those years he attended the scientific courses of instruction open to young men at the Cooper Institute, where he made greater progress, with a higher degree of proficiency in the various branches of physical philosophy taught in those courses, than that made by young men and boys much older than himself, and who were able to devote their whole time to those regular college courses.

Thrown thus into open competition with students who had wealthy parents to maintain them at Yale, Harvard, Columbia, and other great colleges, it soon made itself evident in their extemporized discussions on scientific themes that no amount of mere book-learning or forced collegiate culture can form a substitute for originality of intellect and inherent genius.

Besides this, the regular students of the accepted theories of science, as taught in those colleges and as set forth in the textbooks, had no conception of the revolutionary reconstruction that had been going forward in the office where their invincible young opponent in those nightly discussions was receiving his surprising inspirations. They were nonplussed at his instantaneous solution of difficult and unusual problems in physical science that were nightly coming to the surface for discussion; and even the teachers and lecturers employed in the Institute were amazed at the ready and original explanations at his fingers' ends for difficulties in science hitherto supposed to be inexplicable. They simply knew nothing of the principles of Substantialism which privately had been preparing the intellect of this stripling giant to make him more than a match in scientific controversy for the grave college professors who chanced to encounter him.

These opportunities for public discussion, which he never allowed to pass unimproved, and which were rapidly cultivating in the young scientist a critical acumen rarely witnessed in older students, tended also to the development of his native resources for oratory, which suddenly brought him into prominence as without a peer for one of his age as an eloquent public speaker.

This suddenly acquired reputation in turn caused him to be sought after as a representative debater in the interests of this, that, and the other society in different parts of the city, in which temperance, high-license, total abstinence, capital punishment, and other great questions were constantly coming to the front for investigation, all of which helped in the same general direction, till now the young debater, orator, critic, and scientific lecturer, has perhaps no all-around equal for his age in America, or in fact anywhere else.

We have heard him deliver the most finished and eloquent lecture on the Substantial Philosophy we ever listened to; and very recently we heard him lecture in a Baptist Church in a neighboring town, by special invitation, against the legalized rum traffic of the Nation. His discourse carried the audience by storm, and the pastor pronounced it a "masterly effort, but doubly so in one so young."

In an early number of *The Scientific Arena* he was editorially announced as "A Young Scientific Lecturer," in the following words: "We are no little gratified to announce to our readers



the advent of a new lecturer on Substantialism *vs.* Materialism, and kindred subjects, who is destined, as we believe in the immediate future, to create a sensation in the scientific lecture-field. This young man is Robert Rogers, our office editor, who is without question the youngest scientific lecturer in the world, being just nineteen years of age. We have heard him speak, and have no hesitation in predicting a grand career of fame and usefulness for this eloquent and talented young lecturer."

Robert Rogers, is a native of New York, and was born June 7, 1867, being therefore just turned of twenty-one years. His parents were poor, but highly respectable, his father being a college professor. They died, however, when he was but a small boy, thus throwing him entirely upon his own resources to fight the battles of life. But judging by the manner in which the campaign has opened all along the intellectual line of battle, we have little hesitancy in predicting for the young orator and student a successful and uninterrupted march through the enemy's country.

Before he was twelve years old he had mastered all the branches taught in the public schools in this city, and in his spare hours during the last six months of his schoolboy days he learned to read, write, and speak the German language correctly and fluently, even without a teacher. His originality of thought is among his marked characteristics.

He was naturally peaceful toward his school associates on all normal occasions, but if ever he saw a large rough boy abusing one smaller than himself (and these exhibitions are of everyday occurrence, at our public schools), his physical prowess could not be restrained from taking sides with the weaker party, even at the risk of a thrashing by one possibly twice his own size. But this serious aspect never deterred him from at least trying to right such wrongs, and this uncontrollable detestation of the oppression of small boys on the part of larger ones frequently caused him to return home at night with his eyes dressed in mourning. After his introduction, however, to the Substantial Philosophy in the office of *The Microcosm*, his physical combats were exchanged for those of the intellectual arena, a promotion of which he has ever since been justly proud.

One thing more we should not neglect to say in concluding this brief sketch of our promising and interesting subject, and that is the following:—

About two years ago one of the leading Episcopal clergymen of Brooklyn, who had been a regular subscriber to *The Microcosm* and the *Arena* since their commencement, and a constant visitor at the office of their publication, became so much interested by the conversational powers of the young substantialist, and seeing what he believed to be such a future for the intellect of one so talented, if properly developed, that he proposed to give him a five-years' college course in one of our best institutions of learning, individually bearing all the expenses of the same,—such course to embrace all the higher branches usually included in the curriculum of a great college.

It is needless to say that Robert, as the Rev. Doctor familiarly called our young hero, gladly accepted this offer with many thanks, and with our most hearty approval, and in the last week of September, a year ago, he entered upon his five-years' campaign, intending to accomplish an intellectual triumph during that period which

will make its impress upon the closing decade of the nineteenth century. We believe he will do it, and that those who read this sketch will yet hear the name of Robert Rogers, before the year 1900, spoken of as among the learned and distinguished scholars of the age.

While he is thus pursuing his studies for the great work of his life we expect him, as associate editor, to steal sufficient time from the classroom to let the readers of *The Microcosm* have an occasional scintillation from his already brilliant pen on some phase of the Substantial Philosophy or kindred discussions, a specimen of which appears elsewhere in this number.

And when the present editor-in-chief shall come to lay down the pen in exchange for a golden harp, may some one take his chair as competent to fill it with credit as will no doubt be the boy lecturer.

#### "EVOLUTION OF SOUND" EVOLVED.

Wilford Hall's attack upon the generally accepted theory of sound and the faith of his disciples, the substantialists, in his position is well known to our readers. Those who have heard of Mr. Hall's theory have been divided into two classes, the one accepting the new theory because they were not able to explain the difficulties raised by the distinguished author, and because of his great confidence in that theory; the other, a larger class, feeling it safe in a matter of this kind to accept the conclusions of the great investigators of science, rather than follow the leadership of a man who undertakes to overthrow what has been accepted or proven by some of the greatest minds this world has ever seen. Mr. Thompson's book is a manly attack upon Mr. Hall's theory, and is a valuable contribution to scientific literature. We commend it to all interested in this question.—*Apostolic Guide*.

#### REMARKS BY THE EDITOR.

The above is from the pen of Eld. McGarvey, as we are informed, one of the editors of the *Apostolic Guide*. On the whole it is mild and moderate as contrasted with the derisive attacks upon our plea in the Cincinnati *Christian Standard*, and even in previous numbers of the *Apostolic Guide*.

But we suggest that it is too late in this day of patent historic facts for the *Guide* to reject a claimed discovery of new scientific, philosophical or even religious truth, because the venerable theories it opposes had been accepted and were supposed to have been proved "by some of the greatest minds this world has ever seen."

Where, for example, would the present Copernican system of astronomy have been had the original investigators of the times of Copernicus and Galileo acted upon the sage fogysm of the *Guide*, and let the Ptolemaic doctrine of astronomy alone because it had been "accepted or proved by some of the greatest minds this world has ever seen?" And where would Bro McGarvey's own unprogressive and bigoted organization have been had not Alexander Campbell, fifty or sixty years ago, braved the sneers and contumely of men of his time who insisted upon the same policy as that of the editor of the *Guide*, of letting accepted theories and doctrines alone?

Bro. McGarvey surely has not forgotten that Alexander Campbell spurned, condemned, and "undertook to overthrow" creeds and doctrines hoary with age and respectability, held by their adherents to be as sacred almost as the



Bible itself, and that had been "accepted or proven by some of the greatest minds this world has ever seen," including thirty years of conscientious advocacy of those same creeds by his own venerable father, Thomas Campbell?

Of course there are many grand exceptions in the ranks of that organization to the unwarranted prejudices here complained of—noble Bereans who take no human *Standard* for their *Guide*, but who "gladly receive the word" of substantial truth from God's book of nature, even though it may not have a definite "thus saith the Lord" in the written Scriptures. It is worse than the puerility of children to suppose that all truth is to be found written in the Bible, and a religious body that cannot outgrow that kind of traditional stupidity had better fold their theological tents and depart for the wilderness at once. They are too far behind the age for modern civilization.

Aside from the noble exceptions intimated, we must candidly declare that we find, as a rule, more blind and unreasoning prejudice against Substantialism among the readers of those two papers than in all other religious denominations put together. While the clergy of the Methodists, Episcopalians, Baptists, Presbyterians, Reformed Church, United Brethren, Lutherans, Dunkards, etc., almost to a man accept the Substantial Philosophy as soon as they come to understand it, these anti-materialistic principles—which are the only means on earth of answering Haeckel's and Huxley's objections to the possibility of a future life for humanity—receive nothing but sneers and ridicule from those two leading church-organs, and their mentally-contracted and proscriptive following.

As to Prof. Thompson's "manly attack upon Mr. Hall's theory," so lavishly commended, we venture to assert that Bro. McGarvey has never read our reply to that book as printed in the December number of the *Scientific Arena*, Vol. II, page 104. But the venerable Eld. C. E. Van Voorhis of Knox Co., Ohio, one of the oldest ministers of that church, has read it, and he writes to us that in his "candid opinion it proves the author of 'Evolution of Sound Evolved' to be a dishonest jackass."

We are willing to allow this judicial estimate of the "manly attack" from one of the best known ministers of that denomination, and one of the noble scientific Bereans, to count as a stand-off against all the subsidized commendations from wave-theorists the *Guide* and *Standard* can ever print. There were a few copies of that number of the *Arena* left over. We do not own them but can get them for those who wish to see our reply, at ten cents a copy.

#### THE WAVE-THEORY OF SOUND.

##### *An Unanswerable Argument Against It.*

BY THE EDITOR.

There are numerous separate and distinct arguments against the wave-theory of sound, any one of which, if not met and answered by the advocates of that doctrine, is alone sufficient to break down the theory. But there is one state of facts so palpably and self-evidently antagonistic to the current theory of acoustics that the mind of the most ordinary thinker, no less than that of the profoundest physicist, needs only to be called to the argument to be entirely convinced of its unanswerable character.

We have referred to this state of facts repeatedly in the *Microcosm* and the *Arena*, and especially in the Text-book on Sound, and have urged the great professors of physics in the most respectful language we could command to present, if possible, any sort of reply to it, pledging our word of honor to print such reply in our journal. It is needless to say that cavernous silence has been their only response.

It is claimed in behalf of these eminent professors of physics that Substantialism has not yet become sufficiently respectable to warrant their noticing it, or replying even to our respectful challenges. This respectability-plea, however, is all bosh, and the professors themselves know it. Some of those very professors who make it, or allow it to be made for them, are only too ready to parade their names in the *Christian Standard* and *Apostolic Guide* as indorsers of Prof. Thompson's book against Substantialism, even while declaring, as one of them recently did, that our philosophy was "unworthy of the least notice." We tell these professors that, try as they may to avoid the ordeal of either meeting this philosophy or being met by it, one thing they may be assured of, namely, that Substantialism is spreading rapidly among just as bright and just as scientific minds as their own, and that many of the very students they are teaching the present foundationless motion-theories of science are thinking for themselves and invisibly smiling at what will be when they shall become their teachers' successors.

The argument against the wave-theory of sound to which we allude was fully presented in Vol. V. of the *Microcosm*, beginning on page 38, in which the same urgent appeal was made to teachers of physics to overturn it if they could, pledging our word to abandon Substantialism publicly and in toto if that single consideration could be met and disposed of. Hundreds of the leading professors received copies of that number of the *Microcosm*, and still more of them will receive the present number, containing a condensation of the same argument. Will they notice it?

We learned some time ago by a friendly letter from Prof. Thompson, that he had not seen Vol. V. of the *Microcosm* when he wrote his book, and consequently that he had not seen this argument as given at the page referred to. Immediately on learning this fact we sent him the volume as a present, marking the article named, and requesting as an ample compensation for the book, that he would write us, either making some sort of reply to the argument, if possible, or else admitting his inability to do so. We begged of him to do this as a duty he owed to the world, and especially to ourself for the misrepresentations of our views in his book, (unintended as we were willing to concede), offering if he would do so to forgive all and extend to the young man the right hand of fellowship. But Prof. Thompson, after receiving the book, and no doubt after reading the article referred to, thought the conditions of our little present were too exacting, and he therefore relieved himself of all obligations by sending us the money for the book, preferring as he said, not to receive it as a present. Yet not one syllable did he write in reply to our urgent solicitude that he should answer that one argument referred to or admit its unanswerable character.

The basis of that argument, for the present briefly stated, is this: 1. The wave-theory of sound, as all the books and authorities declare, tells us that sound outside of our sensations is simply

the wave-motion of the air; and that this movement of the air-particles is produced by the vibratory motion of the sounding instrument. There is no need of proving this from the books, since no one will dispute it. A hundred proofs could be given if needed. 2. The same theory tells us that *loudness*, outside of us, is simply the wave-amplitude of the air-particles caused by the action of the sound-producing body; and hence, if one sound is louder than another, it is, as Prof. Tyndall expresses it, only because the air-particles oscillate to and fro farther in the one case than in the other, and consequently because the sounding instrument produces a greater amount of atmospheric disturbance in the one case than in the other.

Now it follows if this be true science, that the sounding instrument of a given pitch or vibrational number, which vibrates the farthest, having the largest surface and consequently producing the greatest amount of atmospheric disturbance, *should in every case produce the loudest sound and be heard at the greatest distance.* There is no disputing this statement by an advocate of the present theory of Sound. To prevaricate or even to deny these premises, would be to stultify the very foundation on which the wave-theory rests.

Hence, we come to the general facts on which our argument is based, namely; that there are many vibrating and sound-producing instruments, of large surface, wide amplitude of swing, and causing a powerful agitation of the air,—in other words which produce intense “condensations and rarefactions of the air” which alone constitute sound according to the theory,—*but which cannot be heard more than six or eight feet away in a still room; while there are other sounding instruments with but a small fraction of the surface to act on the air, having not one-tenth the amplitude or distance of swing with not one-hundredth part the weight, and consequently producing but a slight fraction of atmospheric disturbance, or “condensation and rarefaction” as compared with the others, yet which can be heard nearly one thousand times farther away, and will fill millions of times greater cubical area of air, with their audible sound.* It follows that sound is not produced by air-waves at all, since the last named sounding-bodies, which produce but a slight fraction as much wave-motion of the air as the others, *actually produce millions of times the loudness of sound, and consequently millions of times the quantity of sound produced by the others.*

We do not design to enter into the details of this argument in the present number of the *Microcosm*. We have a paper written and in type which we had intended to print this number, but it was too long. We therefore decided at the last moment to write out this general introduction to the argument, to put physicists to thinking, and reserve the full and detailed discussion of the subject for next month.

In conclusion here we say that this argument appeals to the conscientious intelligence of the whole scientific world. No judicious or judicial professor of physics, with such an argument before him as but a small fraction of the foundation of the Substantial Philosophy, will hurriedly risk his reputation in maligning our views as absurd and ridiculous, or even cast them aside till he has given the subject cool and careful consideration. For plainly and conclusively, if *loudness* does not depend upon air-waves or atmospheric disturbance, as we see it does not, *then sound itself does not depend upon air-waves at*

*all, but must be an immaterial, substantial force, as the new philosophy teaches, analogous to electricity, heat, magnetism, etc.*

In other words, this argument demonstrates as clearly as the fixed laws of mechanics and mathematics can demonstrate anything, that, although sound-force is liberated from various sounding bodies by their vibratory tremor, the force itself or its loudness in no wise depends upon the air-waves or atmospheric disturbances thereby produced,—they being merely incidental to the tremor required for liberating the force, —*but on the contrary, the quantity of sound-force liberated depends entirely upon the sonorous property and cohesive structure of the sounding body itself.* Hence, the overwhelming fact, as above given, and to which no answer can be made by wave-theorists, that a trifling body, with but a hundredth part the action upon the air of another body of the same pitch, *will produce millions of times the quantity of sound.* On this single law, Substantialism is willing to stake its existence, as will be more fully elaborated next month.

#### SALUTATORY.

BY THE ASSOCIATE EDITOR.

As my first formal introduction to the journalistic world, it would not seem inappropriate that I should give a word of explanation to the readers of the *Microcosm* with whom I hope to enjoy the honor of intimate association for many years to come.

To the partiality of my veteran friend and teacher, Dr. Hall, I am entirely indebted for the highly honorary position I am permitted to occupy, as associate editor of the organ of the Substantial Philosophy. That I am proud of the distinction and the honor, it would be affectation no less than ingratitude for me to deny. Were I as capable of filling as I am anxious to fill the place with credit to myself and profit to the readers of this paper, I would without a doubt prove a decided journalistic success. One thing may be depended on, the work to which I have been so generously called by the venerable founder of Substantialism has an ineradicable claim upon both my affection and my energy, and I stand pledged to its promotion by the unflinching efforts of my pen and voice as an essential portion of my future life-work.

To Substantialism and its unfoldings, I owe the best aspirations of my young life. The present and the future, in both science and religion, were anything but clear to me up to the time of my becoming acquainted with this philosophy. With all the teaching I had received up to that time, both educational and theological, the intellectual and spiritual sky was overhung with many clouds and shadows. Doubts assailed me and uncertainties perplexed me on every hand and wherever I might turn for relief. But the moment the substantial and tangible assurances of this new order of things began to unfold themselves to my mind, it was like the lifting of a dense fog and the flashing out of a noonday sun.

It is about five years since I began fully to appreciate the principles of Substantialism, employed as I was at the time in the office of the *Microcosm*. Circumstances impossible now for me to analyze had led me to 23 Park Row, New York, and should I live to be as old as the one to whom I am so much indebted, I shall never

cease to breathe a grateful thank-offering for the providence which directed my steps to that now historic centre of revolutionary science.

The editor of this paper needs no introduction to the scientific and philosophical public. He has for more than ten years been known through his writings as few modern investigators have been known, and his revolutionary teachings have been sought after and read with an interest probably unparalleled in the history of recent physical and metaphysical research.

Substantialism has made its indelible impress on the thought of the present period, and has proved itself not to be an evanescent or passing excitement to be soon forgotten. Substantialism in the language of Dr. Swander, has come to stay, having been welcomed and accepted by many thousands of as bright and cultured intellects as read books anywhere.

To give this radical philosophy a permanent residence in the affections and intellects of thinking men and women, it needs and must have a permanent organ for its defense, and as a medium of access to the public; that organ is the *Microcosm*, so opportunely revived at a popular price, and so fortunately re-established while its founder and editor is still with us, able to stand at the wheel and direct the course of the substantial ship—That organ should be sacred in the affections of every believer in the Substantial Philosophy, and ought to be looked upon by him as his own protégé for which as foster-father he should feel a responsible pride. Such a feeling on the part of every friend, carried into practice, will never allow the *Microcosm* to flag in its onward course of prosperity and usefulness.

For the present I am chiefly engaged in the pursuit of a regular collegiate course of education, through the generous financial aid of a very dear friend and noble Christian gentleman toward whom I shall ever retain the most grateful and sacred affection. While thus engaged, however, I shall not be idle with my pen where-in it can be useful to the cause and the philosophy to which I owe so much. And when I shall close my work in college and come upon a more active and extended stage of public life, I trust that my experience and course of studies shall in no degree have unfitted me for the part I hope to play in aiding and abetting Substantialism, as the true ally of revealed religion.

#### ITEMS OF INTEREST TO SUBSCRIBERS.

[In this initial number of *The New Microcosm*, it is deemed necessary that the following items should appear as information to the general reader. EDITOR.]

1. It will be observed that our 50-cent monthly is without cover or stitching. Such expense would add not less than \$800 a year to the general outlay, should we have, as we hope, 10,000 subscribers; while such cost would add nothing to the solid reading matter of the journal, which is the chief consideration with Substantialists. Besides this fact, the \$800 thus expended for cover and stitching would send scores of thousands of free specimen copies to willing readers, who otherwise would know nothing of Substantialism. We believe that our subscribers would prefer this amount of money to be spent in the missionary work here indicated.

2. It was decided at the last moment to date No. 1, Vol. VI, *December*—one month before the majority of magazines commence—thus giving

the *Microcosm*, in its future volumes, a month start of the average monthlies. It also gives us a longer time to send out specimen copies of this number before No. 2 is in the field; so now is the time for every friend of the cause to push the *Microcosm* before other monthlies commence.

3. If the reader thinks he can secure a club of a dozen names—more or less—among his friends and acquaintances, and will drop us a card to that effect, we will answer by letter, giving such special inducements as will please him. And if any reader desires to engage in an honorable and paying business, such as canvassing for this paper and taking orders for our books, he should at once drop us a line, and we will offer him terms that will surprise him. Also, if he knows of any person desiring such employment, he will do him and us a favor by calling attention. There is room for hundreds of such agents.

4. A minister, teacher, school superintendent or any other person, who will agree to distribute ten, twenty or more copies of this paper among friends, shall receive them by mail free.

5. No advertisements, except our book notices will be admitted into the *Microcosm*. Hence these sixteen large pages will almost entirely be devoted to original matter each month. One thing is settled; the editor and proprietor does not expect, nor does he wish, to save one dollar from the paper during the present year, however large a subscription list he may obtain, but expects to use every surplus dollar over running expenses in sending specimen copies free to persons who will most likely read them. Persons, therefore, disposed to do a little noble missionary work can have 100 free copies sent as they may direct for every dollar they may contribute for that purpose.

6. Should any person chance to get two specimen copies of this number he will know what to do with one of them. An intelligent neighbor will always be ready thankfully to receive a copy and read it.

7. A number of persons have subscribed in advance for two, three, or more copies to aid the cause and to be paid for on receipt of No. 1. These friends generally will receive the number of copies subscribed for which they can deliver to the parties intended and remit us the 50 cents each, when due credit will be made on our books with many thanks.

8. Let the reader who approves the substance of this journal act as his own agent, inclose the 50 cents in stamps or postal note, and thus secure its monthly visits for the year.

9. All subscriptions begin with No. 1 of the volume. It is too small and too ripe a cherry to cut up into pieces. The pages are electrotyped, so that back numbers can be supplied indefinitely. A monthly journal as a rule, not worth electrotyping is not worth printing. Some things necessarily are not worth preserving, but its leading articles always should be.

10. As the teaching of the *Microcosm* is of a revolutionary character in science and philosophy, the reading public should have the benefit of it as largely as possible. Hence, for all libraries or reading-rooms of schools, colleges, churches, societies, towns, &c., we will donate one-half the price, sending it for 25 cents a year. There are more than 3,000 colleges, seminaries, &c., within our reach, whose reading-rooms should be supplied with the monthly issues of the *Microcosm*, and whose patrons would be glad of the information thus afforded. What philanthropist will join us in supplying these institutions?



11. Send remittances in any convenient way. For large amounts send bank-checks, money-orders (either express or P.O.) or registered letters. For less than \$1, send postal-notes, or even postage-stamps.

12. Should any reader know of an intelligent friend—one or more—at a distance, who might be interested in reading the *Microcosm*, he can send us such addresses on a postal card, and we will mail specimen copies free. This is the cheapest method of doing valuable mission work we know of, namely, a one cent postal-card.

13. We had intended to insert the portrait of young Mr. Rogers, our associate editor, in connection with our sketch of him on another page. But in speaking to him about it he begged of us to withhold the honor. It will doubtless appear in a future number.

14. This number of the *Microcosm* will be sent to every reader of the old *Microcosm*, of the *Arena*, and of any of our books, so far as we are able to secure their names. Such friends are cordially invited to try our new volume reduced in price to 50 cents a year. We purpose keeping it, in the future, entirely under our own proprietorship and management, and we promise faithfully never to raise the price.

#### KIND WORDS.

[We have received during the last three or four months, more than 150 letters from our old subscribers, each one of which breathes the same spirit as the following, only expressed in different language. We have room for a specimen only of what would fill a large octavo volume. We quote these extracts, not from a feeling of vanity, but to give new readers an idea of the impression which Substantialism produces on the minds of those who take the trouble to study it.]

The Rev. W. H. Turkinton, a Methodist clergyman of Suncook, N.H., who has taken our publications from the very start, writes:

"I am glad that light is beginning to break, and that there is a prospect of the immediate revival of the *Microcosm*. I think you should send a personal appeal to thirty or forty of the leading Substantialists, asking at least for small loans to help put the new Organ of Substantialism on a firm basis. I will attend to the correspondence if you do not feel like doing it. I inclose \$10 which you can use in the good work. Get out No. 1 of Vol. VI, as soon as possible, and let it be doing its missionary work. Although I am royally entertained in reading the eight volumes of your 'Scientific Library,' yet I miss the fresh discussions and current elaborations of inquiries and arguments which the monthly visits of your periodical bring to my table. I must say that I am greatly inspired and helped in my work as a Christian pastor by the unanswerable arguments against scientific materialism which these writings contain. I have purchased me a magnet and have been performing a number of simple experiments with it according to your suggestions. It is a continual wonder and delight to witness this mysterious, unseen power, acting on distant objects through impervious glass, which Substantialism has made so plain to the understanding as an immaterial entity. I am arranging to present these instructive experiments and proofs of immaterial substances in a lecture on the soul and the future life. . . . The little text-book on sound is a masterpiece of clear and concise reasoning, and must produce its effect upon pro-

fessors of physical science. And the 'Problem of Human Life!' Well, there is nothing like it in all this world. It is an unfailing mine of riches to me. And to think that all these eight volumes cost me but \$5! It is amazing! You ought to have 500 such orders in a single month. . . . Since writing the foregoing I have been plunging into the five volumes of the *Microcosm*, and the bound volume of the *Arena*. They seem as fresh and sparkling as when first read. I sat up till midnight last night reading these works. I cannot make it real that such a valuable magazine, in a field occupied by no other journal in the world, so useful and so necessary, and having thousands of intelligent enthusiastic admirers, should languish for support. I would rather have dropped any other journal I take—and I receive about a dozen. I would even sooner give up my New York *Christian Advocate* than dispense with the monthly visits of your publications," etc.

Rev. Dr. J. P. Lloyd, of Ft. Wayne, Ind., writes: "Every Substantialist ought to feel under the same obligation as yourself to keep this cause afloat; yet as a general rule those who seem proud of the grand philosophy, are willing that you should do all the work, bear all the expenses, and make all the sacrifices, while they merely subscribe for the paper and enjoy its contents. This is not as it should be. . . . Can you give me any encouragement to hope that the embargo on your pen is about to be removed, and that the organ of Substantialism shall again resume its monthly visits? It is almost the daily thought of my life, and the subject of my prayer as well, that your pen should again be employed in the work in which for years it has been so nobly engaged, and upon which your whole powers of mind have been so earnestly set—I will do all I can to aid you. Can I still order your books, \$40, \$50 or \$55, as offered, with a set of Appleton's Encyclopedia as a premium?" etc.

Dr. W. C. Dixon, Gay Hill, Texas, writes: "Take my name as a subscriber as long as I can raise 50 cents. The cause of Substantialism must not flag. It has drawn me from the very vortex of atheism, and I shall ever feel the most profound gratitude to you for such Substantial evidences from nature as have given me unshaken faith in the God of religion. Of course we know that the time will soon come when you must pass away. I hope you are casting about for a successor who will be competent to take your place and carry forward your well-begun work. Who will he be? To my mind, a young man, barely turned of 21 years old, who has attained such a comprehensive grasp of Substantialism as to be capable of writing the article, on 'The Importance of Substantialism to Christian Ministers,' the advance proofs of which you have so kindly sent me, should by unanimous vote be awarded the succession when the founder of that Philosophy shall take his departure. I feel in my heart that the cause has a hero in that young man; and I believe that no minister of whatever denomination can carefully read that article without at once being convinced of the overwhelming importance of the Substantial Philosophy to the cause of religion."

Prof. H. O. Baker, of Verdella, Mo. subscribes for seven copies of the new *Microcosm* and sends the money also for a lot of books to sell, and promises to give all the profits to the *Microcosm* for free specimen copies. He says: "Are there not 200 of the old subscribers who love the cause well enough to do the same? Send me a list of

200 such names as you think would like to aid Substantialism, and I will write to them personally at my own expense, urging them to help this work. I am ashamed that I have done so little for this cause while you have sacrificed everything—even the comforts of life. Little did I dream while enjoying the wonderful pages of the *Microcosm* and *Arena* that the man providence had given us to defend the truth against false science was actually struggling to keep the cause alive and *living on one meal a day*."

#### THE PROBLEM OF HUMAN LIFE.

##### A Subscription-Book for the Times.

Invariable price, \$2.00. Sample copy, (post-paid,) by mail.

No book on religio-philosophical and scientific subjects has proved of such spontaneous demand as this. More than 66,000 copies have been sold since it first appeared, about ten years ago, and without one dollar's worth of advertising—merely by one person telling another of the literary treasure he had discovered. The work is even now in more exciting demand than when it first appeared. It literally "grows with its growth and strengthens with its strength."

We want an agent in every county in the United States and Canada, and will positively give canvassers every penny over the actual cost of producing the volumes, alone for the good the book is calculated to do. With this work and the *Microcosm*, almost any agent can make excellent pay. Write us for special terms for both book and paper. No book ever published has been so favorably and enthusiastically noticed by the press.

Here is a mere specimen out of hundreds of volunteer press-notice.

##### "A Masterly and Triumphant Refutation."

[From *The Christian News*, Glasgow, Scotland.]

One of the most trenchant and masterly opponents of this theory (Darwinism) is Dr. Wilford Hall, of New York. Some time ago he wrote a book entitled *The Problem of Human Life*, in which he subjects to a searching and critical analysis the strongest arguments in favor of evolution advanced by Darwin, Haeckel, Huxley, and Spencer, the acknowledged ablest exponents and advocates of the system. Never, we venture to say, in the annals of polemics, has there been a more scathing, withering, and masterly refutation, read or printed. Dr. Hall moves like a giant among a race of pigmies, and his crushing exposures of Haeckel, Darwin & Co. are the most sweeping and triumphant we have ever read within the domain of controversy. If our thoughtful and critical readers have not yet read the book, we venture to prophesy that they have a treat before them.

##### "The Book of the Age."

[From *The Methodist Press*, at Baltimore, Md.]

This is the book of the age, and its unknown author need aspire to no greater literary immortality than the production of this work will give him; and thousands of the best-educated minds, that have been appalled by the teachings of modern scientists, will "rise up and call him blessed." Hitherto it has been the boast of atheistic scientists that the opponents of their doctrines have never ventured to deny or to solve the scientific facts upon which their theories are based. But our author, accepting these very facts, unfolds another gospel; and Tyndall, Darwin, Haeckel, et al, are mere phantoms in his giant grasp.

##### "The Most Startling and Revolutionary Book."

[From *The Brethren at Work*, Mount Morris, Ill.]

It is unquestionably the most startling and revolutionary book published in a century. There is no escape from the massive accumulation of facts and the overpowering application of principles in which the work abounds from lid to lid. It marks an epoch in the centuries. It is a work of Providence, and will not accomplish its mission in a generation. It unfolds truths that will stay as long as Christ is preached. Although strictly scientific, its one aim is the demonstration of a personal God and a hereafter for humanity. We never tire reading it. It is an exhaustless mine of Christian truth. It is the literary

chef d'œuvre of the age. It is worth its weight in diamonds.

##### "Meets the Wants of the Church."

[From *The Dominion Churchman*, Toronto, Canada.]

We most cordially concede to *The Problem of Human Life* the well-earned title—the book of the age. Doubtless, the God of Providence has raised up the author to meet the wants of the Church in this time of need.

##### "Originality, Thoroughness, and Ability."

[From *The New Covenant*, Chicago, Ill.]

We can truly say that we are amazed at the originality, thoroughness, and marvelous ability of the author of this work.

##### "The Death-blow of Atheistic Science."

[From *The American Christian Review*, Cincinnati, Ohio.]

The author, a man of acknowledged genius, and confessedly the brightest scientific star of modern times, has startled the religious world into transports of joy and praise. No religio-scientific work has received both from the secular and religious press such willing and unqualified praise as *The Problem of Human Life*. It is the death-blow of atheistic science.

##### "The Mightiest Scientific Revolution ever seen."

[From *The Journal and Messenger*, Cincinnati, Ohio.]

*The Problem of Human Life* is a very unexpected contribution to scientific polemics, which, if its reasonings shall be justified, on thorough investigation, will prove to be one of the loftiest achievements of this age, and effect one of the mightiest scientific revolutions ever seen.

Canvassers will be supplied free of cost with bundles of this number of the *Microcosm*, on application, to enable them to leave copies with intelligent families. For information both as to the book and the paper, address the Editor, 23 Park Row, New York.

#### A SENSATIONAL VOLUME APPROACHING.

##### The Art and Philosophy of Great Longevity; or How to Attain Vigorous and Youthful Old Age.

By The Author of the "Problem of Human Life."

This book is now in preparation for the press, and claims to unfold the most important system of hygienic treatment, for the preservation of health and the prolongation of human life, ever made known to the world.

It is based upon a physiological, hygienic and anatomical discovery, made by the author 40 years ago, and by the application of which he has raised himself from a semi-consumptive condition to his present robust health and almost youthful vigor,—now in his 70th year. *It is without the use of medicine of any kind*; and although the treatment is entirely new to the medical profession, it acts in strict harmony with all correct anatomical science, and all true physiological laws.

When the discovery was first made and the treatment first adopted by the author, he was reduced by a gradual decline to almost a skeleton, and was given up by his physician to die of consumption,—his younger brother, Samuel, having just been carried off in that way. The persistent application, however, of the new treatment from that time to the present, has gradually raised him to his present permanent condition and weight of 225 pounds of the firmest flesh, as he believes and as others admit, possessed by any man of his age living.

Some 20 years ago he revealed his discovery and mode of treatment to Richard F. Stevens, M. D., of Syracuse, N. Y., a physician of extended physiological and therapeutical research, and of wide medical practise. The Doctor was surprised and even startled by the revelation, and could only accept the truth of the claimed dis-

covery and its method of application after it had been demonstrated in his presence. The result was, that he immediately adopted the treatment in his own person and practise, and is now its enthusiastic advocate, regarding it as one of the most revolutionary and valuable hygienic discoveries of the century. Writing to a friend in this city some months ago, the Doctor says:—

“ Nearly twenty years ago in this city Dr. A. Wilford Hall gave me privately a detailed history of a hygienic treatment he had discovered and adopted some twenty years before, and which he had practised continuously upon himself up to that time. This history included an account of the failure of his health, the reasonings and conclusions which led him to adopt the treatment, his rapid restoration to health, &c. From the time of his first mention of it to me I have been entirely satisfied that it saved him from a lingering consumption and death; and that in the years following, as I have evidence to satisfy me, its continued practise has so affected the nutrient and eliminating functions as to give to his physical structure a greater degree of solidity, or in other words, a higher specific gravity than that possessed by any other man living. I learn that he has persistently continued the treatment to the present time—forty years in all—and that his present health and vigorous condition may rightly be compared to the “bloom of youth,” though he is nearly seventy years of age. The tests I have made of the treatment upon myself and in my practise in the twenty years past, have convinced me that great practical benefit may be derived by members of the medical profession and others from a careful study of the rationale of the treatment as discovered by Dr. Hall, the details of which he proposes to give in his forthcoming book. A debt of gratitude will surely be due him for whatever scientific advances he may be able to unfold in the line of assisting nature to ward off disease, and in the restoration of health. R. F. STEVENS, M.D.”

As soon as the work is ready for the public it will be announced in the *Microcosm*.

#### THE LECTURE-FIELD OF SUBSTANTIALISM.

We are pleased to announce that quite a number of ministers of different denominations are either now in the lecture-field, or about to take it, for the Substantial Philosophy, believing that such popular method of instructing the public is calculated to do more general good for the cause of religious and scientific progress than is possible to achieve in any other way. Among these contemplated lecturers are the Rev. Henry B. Hudson, *Congregational*; Rev. Dr. John Crawford, *Baptist*; Rev. W. H. Pepper, *Methodist*; Prof. John T. Cropper, *Christian*; Rev. J. P. Lloyd, D.D., *Presbyterian*; Rev. W. M. Kellogg, *Congregational*; etc., etc., etc.; all of whom are thoroughly alive to the importance of Substantialism in the overturning of Materialism and the general advancement of Christianity. We are firmly convinced that any bright lecturer, who will devote himself to this work, aside from the good he will achieve, can support himself and family better than by any ordinary obtainable salary. The field is immense, and the resources of the theme are not only new and exciting, but inexhaustible. We have it in our power greatly to assist such lecturers in their work through the columns of this journal, and will cheerfully correspond with any who may desire to enter this important missionary field.

#### EXCELLENT PROSPECTS AHEAD.

From the very encouraging letters and the numerous advance pledges of subscriptions received up to going to press, we are greatly cheered with the hope of a large subscription list. Not one person out of more than one thousand heard from, to whom we have written personally during the last three or four months, but expresses a warm interest in the perpetuity of the Organ of Substantialism, and a deter-

mined co-operation with the editor for its support. More than 2,000 subscriptions have thus been pledged in advance, to be paid mostly on receipt of the first number. We sincerely trust that every friend of the cause will consider this paper his own property. The *Microcosm*, we confidently predict, will be a power in this land before next December, if only Substantialists will do their duty. All it will need to reach a list of 50,000 subscribers in one year will be for some one energetic friend in each town or village to accept a free bundle of this initial number and place them in the hands of thinking men and women, and thus let the paper be doing its own silent but sure missionary work in thousands of intelligent families.

#### THE COLLEGE OF SUBSTANTIALISM.

This much-needed institution of learning has now a fair prospect of realization. We are authorized to state that a commodious building and beautiful grounds, worth \$10,000, and capable of accommodating 100 students, can be had in Michigan as a free donation as soon as this college can be organized ready to receive them. We want every Substantialist in the country, to let us know at once if he will patronize such an institution, at least so far as to send one or more scholars, provided the cost is at the minimum, and the educational facilities are of a high order. This is all we have room to say in this number. Brethren, let us know your wishes in the premises. The matter is of the greatest importance to the future of Substantialism.

#### DR. SWANDER'S BOOK.

Readers who have never seen the “Substantial Philosophy,” a large volume by the Rev. J. I. Swander, D. D., should by all means send for it and have it in their libraries as a book of reference. It contains more than 800 questions and answers bearing directly on the philosophy of Substantialism, and will well repay a careful perusal. Price by mail, \$1.50. Send the price direct to the author at Fremont, Ohio.

#### IMPORTANT DIRECTIONS.

In sending the names of subscribers, always write short letters, in plain cursive, and thus greatly accommodate our weary book-keepers. If you have anything important to say to the editor, or an order for books, write it on a separate sheet, so it can be removed before handing the list of subscribers to the book-keepers.

#### THREE CASH PRIZES—\$30, \$20 AND \$10.

We will give the above prizes in cash for the best three original essays on Substantialism or collateral subjects contributed to the *Microcosm* during this volume—to be awarded in the order of merit as above, and each contributor to be allowed two trials if desired. The essays will be printed from month to month during the year, one or more in each number. They must not occupy more than one solid page each, or 1,300 words, but may occupy half a page or even less; the intrinsic merit and not the size of the article to be alone considered. The three successful writers will be announced in No. 1, Vol. VII. The judges are Henry A. Mott, Ph. D., LL. D., New York; Prof. Henry S. Schell, A. M., New York; and the Rev. Dr. James A. Buck, Washington, D. C. No person can hope to earn one of these cash prizes who does not study Substantialism and make it his own. We may safely believe that some brilliant work will be done during the year in these prize essays.—EDITOR

#### ARTICLES FOR NEXT NUMBER.

There will be interesting and even exciting discussions in the next number of the *Microcosm*. Among the articles to appear will be Mr. Keely's Motor, and his wonderful philosophy; A solution of an important physical problem, by Reuben Hawkins; The key to the main arch of Substantialism; The inconsistencies of the Molecular Theory; The Motion-Theories of Modern Science: Electricity generated by Heat; Haeckel criticised by Rev. Dr. Crawford, &c., &c.



## THE SUBSTANTIAL PHILOSOPHY:

ITS IMPORTANCE TO CHRISTIAN MINISTERS.

BY ROBERT ROGERS, ASSOCIATE EDITOR

It has often been asked by ministers of religion who have not yet become familiar with the principles of Substantialism: What has this claimed philosophy to do with Christianity, the evidence of a future life, or the work of the Christian minister? We have no doubt but this question has been put hundreds of times to the friends of Substantialism who have been trying to show ministers of the Gospel the importance of the new philosophy in their work of meeting the objections of materialists, and in the important mission especially of confirming professed Christians in their hopes of a hereafter for humanity.

That members of religious bodies who *think* need a continuous confirmation of their faith and hope by substantial evidence of a future life, few observing minds will question; and that something is needed more cogent in removing doubts than the ordinary pulpit outgivings requires no other evidence than casual private conversations, free from restraint, with average young church-members when the question of a personal conscious future life chances to come up for discussion.

This growing tendency to doubt everything is becoming absolutely alarming to well-wishers of the church and of the cause of religious morality; and hence the importance as well as the necessity of any counteracting arguments that may break through this rapidly spreading tendency to skepticism both in and out of the church, and in a marked degree among students at all our institutions of learning, not excepting theological seminaries.

It is this special phase of modern thought which has induced the writing of this paper; and it is this wide-spread tendency to doubt and disparage everything religious which appeals with a trumpet tongue to every minister of the Gospel not to turn a deaf ear to whatever scientific or philosophical consideration that may aid him in his work of overcoming these religious doubts.

If the Substantial Philosophy does really, as its advocates believe, furnish solid grounds of belief in a life separate from material conditions, and if it does really meet the objections of the atheistic materialist as urged against the rational existence of a personal God and the probable existence of the substantial soul of man, then its importance to the work of Christian ministers will not for a moment be questioned after its claims shall come to be understood.

This bearing of Substantialism upon the certitude of a future life is its chief charm to every religious philosopher who comprehends its scope and meaning; for, however indifferent such thinker may be to the consistent and harmonious inculcations of the laws and principles of physical science, he can not be indifferent to the logical relation of those laws and principles to the proof and confirmation of the very essence of religious truth—the existence of a personal God and the substantial nature as well as future conscious existence of the human soul. Ministers who have intelligently accepted the new philosophy regard this as its crowning glory and triumph, and without exception they fervently thank God that ever its discriminating analysis and classification of scientific laws and principles were so applied to religion as to harmonize its teachings with those of natural and applied philosophy.

Hence, it is the aim of this brief paper, not to enter into an elaboration of the principles of Sub-

stantialism nor to discuss the nature of the arguments sustaining them, but to state concisely one single phase of the argument which it was not possible, as he believes, for any other system of philosophy to evolve or even to conceive and which lays the ax at the very root of the upas-tree of materialism.

It is well known to those acquainted with the modern advanced thought of Germany and England, as embodied in the writings of such thinkers as Haeckel, Huxley, Tyndall, and others, that the mind, life, soul, and spirit, or whatever names may be given to the vital and thinking powers of man, are but the vibratory motions of the material molecules constituting the brain and nerve-system. The position thus named is the most confident and defiant assumption in the writings of Ernst Haeckel, the distinguished Professor of Natural Science in the University of Jena, urged by him as an argument against the possible existence of the soul after death, and may be stated as follows, namely, that all the phenomena of vitality and mentality are but modes of molecular motion, or the rapid and varied vibrations of brain and nerve particles. That, however, which constitutes the invulnerable character as well as alarming religious aspect of this assumption of the materialist is logically based upon the scientific teachings of all the Christian colleges in the world as set forth theoretically in their textbooks, in which the various forces of Nature, or at least many of them, are defined as but modes of molecular motion, which signifies the mere vibration of material particles, such as those of air, ether, or solid bodies.

"Why," exclaims Prof. Haeckel, in stating this aggressive argument, "if sound, light, and heat—forces of Nature whose phenomena are so sensibly observed—are but the varied motions of material air and ether particles, as physical science inculcates, why have I not a right to assume and teach that mind-force, life-force, and psychic-force are also but modes of motion of the material particles of the vibrating brain and throbbing nerves?"

By every system of analogy, and according to every principle of scientific ratiocination, insists Prof. Haeckel, if the forces of heat, light, and sound are but the vibratory motions of matter in various degrees of density and tenuity, then mind-force, life-force, and soul-force are justly and rationally explicable only on the same scientific basis of reasoning, as but the vibratory motion of brain and nerve molecules. On this impregnable foundation of natural analogy and intrenched behind these formidable walls of logic, the German and English materialists have finally taken their stand, and now boldly defy religious philosophers to jostle them a hair's breadth by any argument they may bring, so long as the science of the schools stands unimpeached.

If sound, heat, and light, says Prof. Haeckel, are only modes of motion and in no sense substantial forces or objective entities, then away with your religious nonsense that my life or soul or mind or spirit, which exhibits analogous material phenomena, can be anything more than a corresponding mode of molecular vibration! And if sound, heat, and light, as the mere motions of matter, absolutely cease to exist the instant the vibrating particles come to rest, then (continues this invincible German materialist) the soul, life, mind, and spirit, as analogous motions of brain-matter, must likewise cease to exist at death, when the brain and nerve molecules cease to move, and therefore that death, logically and unavoidably ends all!

Such was the aspect of scientific and religious

philosophy when the editor of this paper hurled *The Problem of Human Life* like a thunderbolt from the sling of Jove into the defiant ranks of German and English materialists. The religious philosophers of both hemispheres, who had come seriously to face this triumphant argument of the materialists, stood absolutely appalled at its overwhelming conclusiveness against all scientific evidence favoring a future life.

To think of questioning, for one moment, the mathematical deductions of the ages by which the natural forces of sound, heat, and light had been demonstrated to be but the mere motions of matter, was hardihood too nearly bordering on lunacy for any college-bred clergyman to venture. It would not meet the case to admit that possibly electricity which will disintegrate a tree, and magnetism which will lift a bar of iron, might be substantial, and thus try to think that the soul might also be some kind of substance. Such reasoning would only excite the ridicule of a bright materialist. What weight could such a fact have so long as three of the known forces (heat, light, and sound) were admittedly but *motion*, which ceases to exist whenever the moving molecules come to rest! To admit even one of the forces of Nature to be mere motion—mere phenomena of matter—was to surrender the whole cause of human immortality, as based on scientific analogy, bodily and abruptly into the hands of the materialists.

What argument, in the name of reason, exclaimed one minister when the matter was fairly presented to him, have we left for the substantial nature of the human soul, when *heat*, with all its wonderful workings, is conceded to be but a mode of motion,—but the vibration of material *ether*? What evidence can I offer from Nature's analogies to my skeptical neighbor that life-force or soul-force can exist as a substantial entity after the brain-particles cease to move at death, when heat-force—"its essence and quiddity, is motion and nothing else," as current science teaches? And if *sound-force*, as motion, absolutely ceases to exist when the moving air-particles come to rest, why should not *soul-force* or *spirit-force*, as motion, also cease to exist when the moving brain-particles cease to vibrate at death? Where is there a basis for Christian hope, if modern science be true?

At this appalling juncture in the crisis of religious philosophy *Substantialism* made its appearance upon the stage of human controversy and demanded a hearing. It threw down the novel gauntlet at the very feet of Haeckel by denying the logical basis of his whole argument, namely, that sound, heat, light, or any other phenomena-producing force in Nature, was a mode of motion; and for the first time in the history of science it proclaimed, to the consternation of materialism, that all force, of whatever form, must in the nature of things be substantial, and therefore indestructible. Thus, at a single flash of originality, was a way opened amid the chaotic windfalls of contradictory theories for escape to the advocates of religion, and by the same flash of original truth were these galling materialistic fetters of Prof. Haeckel broken.

By demonstrating sound, light, heat, and every other form of physical force to be *substantial* though immaterial entities, as was clearly done in elaborating the Substantial Philosophy, it was but a natural and logical step to the conclusion that the life-force, mind-force, and soul-force which move and control our bodies were also real substantial existences, and thus the very sword-like analogies of Nature which Haeckel and his confre had sharpened upon their German and English griststones

were wrenched from their hands and their fatal blades turned against the vitals of materialism.

This imperishable achievement of the founder of Substantialism has done more for the cause of Christianity and the spread of true philosophical knowledge, when its scope and meaning shall have come to be comprehended, than all other scientific and philosophical advances ever made since Paul stood upon Mars Hill. The scientific facts and arguments by which this discoverer has for ten years been battering down the atheistical fortifications of the enemies of religion can not even be hinted at here. They are to be found scattered all through his eight or nine volumes of scientific and philosophical writings, so plainly set forth that they who run may read.

He has called repeatedly, both in *The Microcosm* and in *The Scientific Arena*, for any minister of any denomination to show the least shadow of a logical argument against Haeckel's materialistic doctrine of *soul as a mode of motion* on any other basis than that of Substantialism, or so long as the motion-theories of heat, light, and sound are recognized and accepted as science. The Rev. Dr. Deems of this city thought that there must be some other way of overturning Haeckel's motion-theory of the soul besides Substantialism, or otherwise what has kept religion upon its feet all these years before Substantialism was thought of, and with the motion-theories of heat, light, and sound taught in all our colleges? But when urged by Dr. Hall to produce a single argument against Haeckel's view outside of the Substantial Philosophy which repudiates all motion-theories of force, he was necessarily silent.

The truth is, religion has not been fairly on its feet, scientifically speaking, since the wave-theory of sound was formulated by Sir Isaac Newton and accepted as science, but has been prostrate in the dust with materialistic logic clutching its very throat, though it was so stunned by the attack it did not realize its helpless condition. Even the mighty intellect of Joseph Cook could see no way out of Haeckel's clutches while accepting the motion-theories of heat, light, and sound, as so clearly pointed out in *The Problem of Human Life*, page 71. We are astonished that any clergyman of any church can read these arguments as elaborated in Dr. Hall's various publications, and for one moment withhold his willing and enthusiastic assent to the principles of Substantialism, which, by overturning the motion-theories of the physical forces and transforming all force into immaterial substance, has triumphantly rescued religion from these materialistic garroters, and demonstrated the soul to be a substantial entity.

We can only add, in conclusion, that so important is this single analogical phase of Substantialism, that, in our judgment, no minister, no teacher, no scientific thinker, and no member of a Christian church, can afford to be without the light which this philosophy has so opportunely shed along the benighted pathway of man.

## CONDITIONS OF FORCE.

BY GEORGE B. JOHNSON.

DR. HALL.—Dear Sir: Has force motion, like matter? That is, does force move? Can force be quiescent.

Is force, like matter, subject to concentration and diffusion? Is it more here and less there, collecting in nodes or masses? Is force separable into particles and bodies, separable into portions, like



matter? Does force form into personalities—detached existences?

If force forms into bodies or personalities, are these separable portions subject to conditions—governed by law? Or is each personality a law to itself, independent in action, doing its own will without subjection to ulterior control—not bound by ulterior influence?

Can there be matter without force? And can there be force without matter?

Does inertia apply to force as well as to matter?

Do "emanation," "radiation," and "pulsation" force, imply motion of force? And do they imply motion of force by particles? What is a particle but a small portion or body detached from the rest? When force of any kind emanates or radiates in pulses from anything, how does it emanate or radiate or pulsate, except by movement of particles of the force?

CORNING, KANSAS.

#### REMARKS BY THE EDITOR.

Mr. Johnson is a thinker. No man could possibly conceive and propound the queries he has here presented without profound and very careful thought. We will try to answer the gist of his questions as far as we can conceive answers for them, though many of them border so closely upon the infinite that finite mind must totally fail to reach a definite solution. We will not, however, try to answer them in the catechetical order in which they are given, but will endeavor to cover the whole subject involved in our general remarks.

In the first place we must regard force, *per se*, as an absolute entity—an immaterial substance, having few, if any, of the recognized properties or characteristics of matter, even in its most refined and attenuated condition. This has been set forth in our various discussions of Substantialism so elaborately that little in the way of proof or argument needs to be presented here.

If force be a real, substantial entity, it must be subject, in the very nature and meaning of *existence*, to the conditions of locality, intensity, divisibility, &c. In other words, if force be substantial, it must, like matter in this respect, be capable of concentration or rarefaction; it must be conceivable as present or absent in a given place, and hence as composed of separable portions.

We agree with our contributor that a particle of matter is but a small portion of matter, whether it be actually separated from a larger mass of the same substance or only bounded mentally as constituting a part of a homogeneous mass. The smallest conceivable particle of water, if separated from the ocean, is the same individual particle of water it was when not separated, and when constituting an undivided portion of that liquid.

The same conditions and properties of divisibility, extension, inertia, separation, &c., also exist in air, or even in pure hydrogen, the rarest known gas; and we see no philosophical reason why the same gas, if so far sublimed and transformed by infinite analysis as to pass beyond the border of materiality and change to immaterial substance,

should not still possess at least many of these same characteristics, such as divisibility, separability, boundary, concentration, &c. In other words, an immaterial substance, such as magnetism or electricity, must of necessity be constituted of infinitely small portions or particles when viewed by infinite intelligence, the same as is matter. The man who should deny this and attempt to make heat, light, magnetism, electricity, and other immaterial substances, devoid of all portional constitution would find his hands and head crowded with difficulties.

Immaterial, substantial force, being thus conditioned on the same general plane of material bodies, must in the nature of things be susceptible of moving or not moving, as the case may be. We see no reason why cohesive force, for example, in possession of a lump of matter at rest, may not in such case be quiescent force. Our recognition of the natural forces only when actively at work is no proof that they may not be stored up in quiescence, as in gunpowder, for example, ready to be set to work by the proper co-operation with other forms of force. We know that various forms of force may be less active or energetic at some times than at others. If, then, they can approach quiescence from a state of greater intensity of action, we have only to extend this approach far enough to bring force as a substantial entity to absolute rest. As to inertia, it may or it may not be a property of force, as viewed by the Infinite.

In the purely physical realm, force has no will or volitional power, being governed by fixed laws in its movements, velocity, method of producing results, &c.

In the organic realm, on the other hand, force has not only given to it by the Author of Nature similar involuntary characteristics to those of the physical forces, but a vastly higher form of force, especially as the higher orders of organic being may be recognized, in which the force itself has delegated to it volition or the power of choice—the power to will to do this or that. The highest grade of this form of force, as exhibited in man, constitutes rational personality, wherein consists human responsibility of action, and without which moral right and wrong would be obsolete words in our language.

As to the possibility of matter existing without force of some kind, it becomes an almost infinite problem on its face. So far as finite observation extends, tangible matter cannot exist without the influence of forces of various kinds, such as heat, gravity, cohesion, &c. But force can and does exist without matter, as when gravity or magnetism passes through a vacuum to grasp a body beyond.

According to Substantialism, matter once had no existence at all. God alone existed as the infinite embodiment of all things that were to be. From this omnipresent fountain of pure force and pure

intelligence sprung the universe of finite forms of force as well as of all material things. We trust that this answer will at least partially satisfy our excellent correspondent.

### THE NEW MICROCOSM.

We already begin to feel the pressing want of room, for the ever-expanding discussions of Substantialism and kindred topics, in a 16-page monthly. We have subjects already written up of great importance to thinking men and women, enough to fill several such numbers as this, to say nothing of many choice contributions from the pens of our old and reliable contributors. These various productions must appear from month to month as we shall find room for them. Many readers of this revived *Microcosm* will no doubt insist upon having 32-page numbers as of yore, and would be only too glad to pay the old price of \$1. But we dare not attempt to charge more than 50 cents a year. We greatly prefer 10,000 subscribers at 50 cents to 5,000 at \$1, even if it does involve more labor, expense and trouble, because of the greater good we are thereby enabled to do. Better to leave one-half of our readers hungry for more after they shall have devoured each monthly *Microcosm*, than to drive a third of them away by sending them more than they care to read, and charging them more than they feel willing to pay. The happy medium is what we were determined to strike and then adhere to it through thick and thin. Those whose cravings for the strong meat of Substantialism cannot be sated with such monthly numbers as this, are generously commended to the eight volumes of our "Scientific Library," in which they will find substantial lessons for study and scientific food for reflection which will require a whole year properly to digest. If these monthly numbers are not large enough for our old readers, as we feel sure they will not be, let us suggest that they read each number two or three times over while waiting for the next, and we guarantee that they will be the better prepared to understand and appreciate the succeeding issue when it appears.

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[From the Arena.]

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# The Microcosm

A MONTHLY JOURNAL OF SUBSTANTIALISM AND COLLATERAL DISCUSSIONS.  
THE ORGAN OF THE SUBSTANTIAL PHILOSOPHY.

A. WILFORD HALL, Ph. D., LL. D., Editor and Proprietor.

(Author of the "Problem of Human Life," "Universalism Against Itself," Editor of the *Scientific Arena*, &c., &c.)

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Address all communications to A. WILFORD HALL, 23 Park Row, New York.

Vol. VI—No. 2.

JANUARY, 1889.

50 Cents a Year.

Entered as second class matter at the New York Post Office.

## KEELY MOTOR.—INTRODUCTORY.

[We have received many inquiries of late concerning the Keely-Motor, once noticed so favorably in the *Arena*. We shall endeavor to give some information concerning it in future numbers of the *Microcosm*. For the present we give below an article which in the regular course of our editorial work we prepared for the *Scientific Arena*; and though we insisted upon its publication, it was peremptorily rejected by the publishers.]

## MR. KEELY'S WONDERFUL PHILOSOPHY AND MARVELOUSLY CONCISE TERMINOLOGY.

BY THE EDITOR.

We are satisfied that there is much misapprehension abroad concerning the nature of Mr. Keely's discoveries, and that this misunderstanding tends greatly to the public prejudice which exists against the value and importance of his achievements in science, philosophy, and especially mechanics, though we are pleased to know that all these mountains of prejudice do not seem to have the slightest effect upon the implicit confidence of his devotees and followers.

As an illustration of the unfortunate obscurity in which Mr. Keely's discoveries and especially his philosophy is often involved by his friends, though unintentional of course, take the following sentences from an article on "Ethereic Force" signed "M." which most readers recognize, as printed in a late number of the *British Mercantile Gazette*. Though these sentences purport to come from Mr. Keely himself, it seems difficult to believe it by one who has become familiar with the remarkable lucidity of his style, and the beautiful flashes of pure English which scintillate from his versatile tongue. But here are the quotations aforesaid from the *British Gazette*:—

"Chords of masses include in their conditions all pertaining to molecular, atomic and etheric positions. The chord of a mass *molecular*, and the chord of one *etheric* as regards their quality of tone is as different, one to the other as the rumbling of the earthquake to the finest tones of the Æolian harp; yet the significance of the one is as great under its own conditions as is the other.

There is no true coincident outside of inter-etheric positions. Differentiation is the govern-

ing feature of every thing terrestrial. \* \* \* The rotation of the etheric envelopes of the different orders of atoms is the only medium free of differentiation as regards their velocity. The disassociation of the atomic triplets, left to themselves, is a matter of infinite impossibility, on account of the uniformity of their rotary envelopes. If the velocity of these rotations are differentiated or arrested by the negative chord of their rotation, the result follows of their breaking up, thus dissociating themselves from their immediate aggregators, and expanding into immensely multiplied rotary volume of a kind having sympathy with the next progressive order of dissociation. For instance, if a molecular condition is subdivided, the sympathy would be with the inter-molecular; if atomic, it would be with the inter-atomic; and so on till the luminous condition would be reached which is in the seventh sub-division. Compound etheric separation intensifies the first order of luminosity," &c., &c.

Now we insist, with all due respect to "M," who has our profound esteem, that this language does injustice to the lucid and well-known perspicacity of style in which Mr. Keely is in the habit of setting forth the simple advantages and beautiful merits of his great discovery. The language quoted may have been used by him, but owing to a want of the proper connection in which his statements were made, apparent obscurity sometimes occurs, especially as reproduced by superficial listeners, or by those not familiar with the vocabulary of such highly scientific terms. Take any of the fragmentary descriptions of his pulsatory discoveries, as he hurriedly gives them off in the midst of his exciting exhibitions, and then disassociate them from their relative connections with his liberator, and unless the reporter is versed in the metaphysico-scientific terminology of this inter-molecular, inter-atomic and inter-etheric philosophy, he will almost certainly give the language a trend of obscurity or doubtfulness of meaning which will make it almost unintelligible, especially to the superficial reader. But when apprehended in the light of the inventor's own clear enunciations, as so frequently given in public, setting forth the simple processes of the pulsatory vibrations of the inter-etheric force which he eliminates by means of his fiddle-bow and tuning-forks, no one of even moderate education or intelligence can fail to grasp the entire philosophy, even to its minutest details.

To show that the foregoing quotations from the London paper have manifestly done injustice to Mr. Keely's remarkably lucid and laconic manner, when explaining the merits of his new ethe-



ric pulsations, we refer our readers to his own explicit statements as given to the associate editor of the *Scientific Area*, and copied by him in his able article in the January number of Vol. I., at page 120. Here are Mr. Keely's own words and no garbled misapprehension:

"In the liberation of etheric ozone an apparatus of wonderful strength and peculiar mechanical parts had to be used, and the difficulty of conceiving such a one can only be appreciated properly by knowing that an atomic percussive resistance has to be controlled of over 110,000 pounds per square inch to effect it. At this point the second order of etheric luminosity presents itself of wonderful intensity.

"The condition necessary to produce this effect is to induce an antagonistic relation between the liberators, chords of masses, and chord-mass of one of the steel spheres, used for that purpose (of which there are two), the negative one as the introductory one, of 33 1-3 against 66 2-3 against 100—of the volume of 100, on any and all molecular masses.

"These conditions produce the highest order of repellant antagonism at the point of union. The fact of the sympathetic chord leading the antagonistic ones on the triple introductory vibratory impulse accounts for the wonderful percussion that takes place at the point of repulsion and thus breaks up and subdivides on the compound etheric position, and it is at this point that high luminiferous ether is evolved, as also etheric ozone. The spheres that carry this rotating force contain each nearly four hundred pounds of decarbonized steel to carry a volume the size of an ordinary billiard ball. Three years of experiment was absorbed in getting the proper transmitting leads and compressors necessary to hold under control the force during its evolution, and yet the cry has been, why don't Keely hurry up and get through?"

Of course, such a cry is entirely unreasonable. Now we ask the reader in all candor to imagine anything more satisfactory or explicit than the language here employed. For ourself we do not profess to be versed in the higher mathematical computations of inter-etheric and pulsatory physics, as they relate to the seventh order of luminiferous ozone; but we would consider ourself very stupid indeed should we fail to catch Mr. Keely's full meaning, especially when given in his own concise language as above. His words are especially lucid when he shows, as he does in some of his exhibitions, how the vibratory envelopes of the inter-etheric atoms disassociate themselves from the negatized molecules of ozone during its transition from the fourth order of luminosity. Such a concise description is as easily comprehended, even by the youngest beginner in philosophy, as would be the well-known description of Bonaparte crossing the Delaware and Lackawanna canal.

Even when he comes to illustrate, as he frequently does, the relations subsisting between the mass-chord or the chord of the mass of a man weighing 225 pounds and the harmonic sensitizer of a wave-plate and a circle of subdivided ozone tuned to the 45th octave in B major, we had not the slightest difficulty in understanding the process, so lucidly but laconically did he describe it.

On one occasion however, we took the liberty of mildly suggesting to the distinguished philosopher that it would be well to accommodate his language as much as possible to the more uneducated visitors at his exhibitions, and thus to

avoid the prevailing impression of obscurity in terms and phrases which, by some unaccountable means, had so unjustly obtained currency. He promised us publicly that he would do so, and we had the pleasure of witnessing a decided improvement in his style at the very next exhibition, at which he showed his visitors in plain language that he had been misunderstood, and that instead of teaching, as some irresponsible reporters had represented, that the inter-atomic ether acts directly upon the rotary envelopes of the molecules and atoms by which sympathetically to liberate the luminiferous ozone, he merely describes these envelopes or vibratory pellicles as the neutral centre within which the etheric vortex is maintained, so that whenever two millions two hundred and forty five thousand of these envelopes pulsate in unison at the same time, the mass chord of any man, or the chord of the mass of any woman is at once determined through the proper sensitizing rod. And that whenever the two pulsatory discharges of this inter-molecular ozone and luminiferous ether shall make half a circuit of the negatized ring, they naturally unite in what may be called a bridge of mist, whose sensitized extremities negatively develop coincident mass-chords with a unisonant intensification so near the harmonic fifths of the diatonic scale as to be but the one-quarter of a molecule apart.

The applause at this juncture was deafening, at which Mr. Keely gracefully bowed. He then went on to explain, as soon as the applause had subsided, and in the most emphatic language, that by means of these negatized axial centres of the atomic envelopes the projecting rays of neutral ozone may be collected and caused to oscillate, as it were, in reciprocal sympathy with the atomic envelopes themselves, till they become fully sensitized and a reaction occurs, when in an instant the seventh chord of the mass, as associated with the luminous flow, unites with the pulsatory condition of the diatonic register and a complete sympathetic equation is established.

And this, he insisted, in language that could not be misunderstood, was the plain reason why it required a triplet series of 432 octaves of tuning-forks to coincide with the percussive conjunction of all the vibrators in his liberating process at one time, in order to disassociate the three orders of harmonic fifths from the double-octave negatizer which is so essential in maintaining the equilibrium of the mass-chords. But this, he explained, in no wise interferes with the inter-etheric ozone combining with the seventh order of luminiferous intensity, especially while he is performing on his mouth organ. If the precaution here named were not taken, and should the minor thirds of the scale of 27 degrees in G. major chance to secure continuity with the transmitting radiators, an explosion of the entire liberator would no doubt be the disastrous result.

The spontaneous approval of the audience here manifested, at which the countenances of the stockholders present glowed with pecuniary animation, encouraged the great inventor to continue his instructive remarks, and in the midst of breathless silence he went on to show how simply and beautifully the liberator, when in disassociation with the negatized sphere of the engine would, after his governor was completed, become instantly sensitized by his drawing the bow only once over a double octave E-flat tuning fork, thus registering in the dome of the liberator 140 octaves of triple harmonies, with a

tension having a pulsatory value of three hundred and eighty-four million atomic force-units. He challenged any physicist present to contradict this result, though he admitted it to be in direct opposition to all the text-books on the subject.

The inference, he continued, from this adjustment of differentiation and sympathetic interchange on  $33\frac{1}{4}$  inches of the new medium or etheric transmitter, through a differentiated wire composed of alternate sections of silver and platinum leading to the compound vibratory inter-etheric telephone, must necessarily be that the equating interferences of the negatized drums of the radiating reflectors will prove as plainly as any proposition in Euclid that the disassociation of these equating interferences and negatized attractions of the combined atonic and molecular triplets connecting with the three minor keys of the regular 140 octaves of the suspended liberator, will check the non-intermittant flow of ozone in time to avoid a collision of the sympathizing mass-chords and chords of the mass and thereby prevent an explosion.

If his position, he continued, on this phase of the harmonic repulsions of the molecular envelopes were not correct, then how was it possible, — said he, raising his hand above his head in a defiant attitude, and looking savagely at the editor of a city paper present who had made some adverse criticisms of his motor—how is it possible for a T-minor fiddle-bow to produce on a common B-flat tuning-fork and sympathetic wave-plate a compound double chord of the mass, even without the aid of a sensitizer, till the luminous ozone, traversing a solid steel wire four feet and a half long, would make the mercury of a centigrade thermometer boil till meteoric scintillations of the thirty-fourth order of harmonic intensity on a graduated scale of fifteen octaves in F minor would fill the room sufficiently to stop an eight-day clock?

The disgruntled editor of the city paper gave it up, and so does the present writer.

## THE REVISED CREED of SUBSTANTIALISM.

BY THE EDITOR.

In the progressive development of the Substantial Philosophy it becomes necessary occasionally to restate its cardinal and salient features, with any additional principles it may have unfolded, that new readers of the *Microcosm* may have before them a succinct general presentation of the doctrine involved, and thus be saved the trouble of asking many questions and puzzling over many already solved difficulties in their correspondence with this office. The following will approximately meet this want, all the essential teachings of which having variously been elaborated in many leading articles as now set forth in our "Scientific Library" of eight volumes, noticed elsewhere.

1. The Substantial Philosophy teaches that force *per se*, of whatever character, is a substantial objective entity, or, in other words, that it is an immaterial, active substance, in direct contrast with matter in its gross, tangible form. By immaterial entity is signified a substance of such character as will act in defiance of material conditions in at least some of its manifestations, as for example, light, magnetism, life, mind, etc.

2. It teaches that all the entities of the universe, or all the objective things which exist and of which the mind can form a positive concep-

tion, whether visible or invisible, whether tangible or intangible, including every phenomena-producing cause in nature, are divisible into the two grand classifications of *material* and *immaterial substance*, and that an entity is none the less substantial, if capable of producing a positive effect, or of acting as the cause of an observed phenomenon, because it is not subject to physical tests, nor can be shown to exist by mechanical or chemical analysis as is the case of the gases, liquids and solids. It is only the defectiveness of our current education—in which *motion* is made to play so prominent and impossible a part—that the idea of immaterial substance is difficult to grasp by the ordinary mind. The notion, as commonly held, that *matter* and *motion* constitute all there is in the universe, is the pernicious error of the scientific scholasticism of the present day, against which the heaviest guns of this new philosophy are continually trained.

3. Substantialism teaches that *motion* is an absolute *nonentity*, having no existence either as a thing or as a cause of any observed effect, and hence, that the whole scientific world is in fatal error in assigning to motion, *per se*, any part whatever in the production of natural phenomena, much more is it in error in teaching, as it does that any of the forces of nature are constituted of "*motion* and nothing else."

4. Substantialism was the first system of philosophy ever promulgated to define *motion* and correctly distinguish it from *force*. It defines motion "*as mere position in space changing*," and hence, that motion—this *changing of position*—had no existence before the body commences moving, and absolutely ceases to exist the moment the body comes to rest. *Motion*, therefore, can in no case be a cause of any conceivable effect, but is itself the non-entitative effect of some form of substantial force as its cause. The splintering of a tree, for example, by a cannon ball, is not the effect of the ball's motion in any possible sense, but is the effect of the dynamic force of the exploded powder and the material contact of the ball with the tree,—the motion or changing position of the ball being merely incidental to this substantial force, just as the nonentitative shadow of a tree is incidental to the partial interruption of the substantial force of light.

5. This philosophy teaches that as in the material realm of substance there are different departments of entitative existence, consisting of various degrees of grossness and refinement, as in the metals, minerals, earths, organic structures, liquids and gases, including odor, on the very border-land of materiality, so there are in the immaterial realm various classes of substantial entities of different degrees of refinement or sublimation, such as the various physical forces,—heat, light, gravitation, magnetism, sound, electricity and cohesion,—thence still higher into the vital, mental, psychical and spiritual realm containing the most refined of all the grades of substantial existence, though as really entities, as are the physical forces, and as truly substantial (though immaterial) as are the rocks and rivers of our material earth.

6. Substantialism, thus recognizing a world of immaterial substances rising from the lower to the higher grades corresponding to those in material nature, and which are necessarily as indestructible and real as matter itself, has no difficulty in assuming on logical and well-grounded assurance, a future state of existence separate from material conditions, for the vital and men-

tal forces as a combined conscious entity which so clearly and indisputably have in man a definite, substantial, and personal existence here.

7. If life, mind, soul and spirit, constituting as they unquestionably do, a conscious substantial, and personal existence here as demonstrated by the substantial and objective existence of all the natural forces, then Substantialism assumes it to be reasonable and according to the eternal fitness of a universe governed by a supreme personal intelligence, that this rational, vital, mental and spiritual force which pervades and controls our material bodies, should continue to exist in a rational and conscious state, even of expanded liberty and activity, when separated from its earthly environment and its material limitations. But all such possibility is utterly insupportable, as this philosophy was the first to show, if the motion-theories of force as taught by present science be true.

8. It is, therefore, the chief glory of the Substantial Philosophy, in vindicating natural and revealed religion from the baleful blight of materialism, that it has been able successfully to attack and wipe out these motion-theories of force with which even our Christian colleges are now furnishing the Haeckel and Huxley school of atheists with their most powerful dynamite for overturning the claims of Christianity. Accordingly, it was but a logical step in this scientific ratiocination to select the most self-apparent and unquestionably relied upon motion-theory in the range of physical philosophy—namely, that of *sound*—as the crucial test of the capacity of this new departure for overturning the current doctrines of the physical forces. If the wave-theory of sound cannot withstand the shock of this assault, Substantialism reasoned, then every motion-theory of science which has grown out of the present doctrine of acoustics must necessarily break down, and with this result every form of force is resolved into immaterial substance, causing the superstructure of materialism to crumble to ruins.

9. It is but another link in this chain of reasoning, as Substantialism teaches, to assume the personal, substantial and conscious existence of a primordial and supreme intelligence as the author and originator of the present material and immaterial system of the universe. This philosophy further teaches that the present order of natural things, including all orders of living and organic creatures, was the work of intelligent creation on the part of that infinite intelligence which we call God; that the theory of the evolution of one form of being from another, or in other words that the doctrine of the transmutation of species by natural selection and survival of the fittest, is unreasonable and without any real foundation in natural science; while it insists that "theistic evolutionism" is but a sorry truckling to the open infidelity of Darwin, and the avowed materialism of Haeckel, without of course so intending it on the part of its advocates, many of whom are pious but misinformed Christian men.

10. Substantialism further teaches that although the natural substantial forces, such as light, sound, heat, electricity, etc., seem inherently *active*, they are as incapable of self-movement as a lifeless clod, having only a delegated power to act received from the author of nature including its laws and forces. With the idea of one self-existent, uncreated, and supreme, first cause accepted, it is easy to see that every different manifestation of natural force can have its delegated power to come forth from the uni-

versal fountain of conserved energy by the means appointed thereto, and to act and manifest itself under natural and established restrictions. Without this delegated ability to act, electricity would not travel along a wire, nor shoot in terrific streams from the rain-cloud; without the primordial permission from the author of nature, neither sound, light, heat, nor gravity could stir or produce any effect in nature; and but for this original and persistent supply of vitality and mentality from the corresponding force-element of nature, no living thing could exist or move upon the face of the earth, or within the waters of the deep. To the consistent Substantialist the immanent presence of the living God is the persistent cause, through his established laws of every breath we inhale, of every act we perform, and of every thought we think.

11. Substantialism assumes the uncreated personal existence of this allwise author of nature (though an infinite mystery it is true,) as almost infinitely less difficult to accept on the part of finite intelligences than to be compelled to grapple with an almost infinite variety and number of equally unsolvable mysteries in every living thing and in every material and immaterial object that confronts us, each one of which is as impossible for us to grasp and explain, as to account for the self-existence of an immaterial and unoriginated Deity. How much more reasonable and satisfying then, on the part of finite man to accept with reverential awe the single mighty and inexplicable mystery of an uncreated personal and infinite intelligence as the comforting solution of all the minor mysteries of the universe!

12. Substantialism teaches that the more real or essential entities of universal nature are the immaterial but substantial forces which are the immediate moving causes of all observed phenomena, while matter itself, in its multitudinous forms, though also real, is but the varied manifestation of such immaterial substance, from which doubtless it originally came. Our material organisms, for example, are but the clothing or pericarp, so to speak, of the vital and mental ego that constitutes the man, and that manifests its real self-entity to our imperfect sensuous apprehension through these material structures. According to the same principle, a granite boulder would cease to exist in tangible form, or, in other words, be dissipated into an insensible gaseous condition, but for the substantial force of cohesion which holds its material particles together. The human body may be just as perfect in form and detail of material structure when dead as before the vital force-entity has departed. But it is not a *man*, because the "inner man" has left it.

13. It is the teaching of Substantialism that man is a dual substantial organism, with an inner vital and mental, though immaterial structure, as perfect in organic form and detail as the material anatomy which clothes it, and which is the exact counterpart of this internal and invisible structure; and could our vision be so refined as to behold this internal organism we would look upon a perfect counterpart of the corporeal being presented to our view.

14. To show the scientific reasonableness of this dual view of man's organism, many considerations are culled from nature, and have been elaborately presented in the 10th and 11th chapters of the "Problem of Human Life." Only a single one of these considerations can here be presented for want of space: A supernumerary finger, for example, has often been amputated



from an infant's hand, and, to the surprise of the surgeon, in a few weeks a new finger of the exact size and form has grown in its place. How was such growth possible? Substantialism explains, that the vital but immaterial organism of that child's hand formed the invisible but real pattern or guide for the organic bioplasts to follow in building out another finger even to the very nail and cuticle of the amputated member. Otherwise, if there were no such substantial guide, why did not the bioplasts produce a toe or a formless mass of flesh and bone instead of a perfect duplicate of the original finger? The same thing occurs in the lower orders of animals, as for example, in the amputation of the leg of the salamander, every detail of which will be reproduced by the animal bioplasts in following the remaining pattern of the vital but substantial leg of that reptile. A number of important objections and difficulties present themselves at this point, all of which could easily be answered had we room, but we can only refer the reader to our voluminous discussions of this question in our other writings.

15. It is the teaching of Substantialism that every living animal and vegetable organism, as well as man, possesses an interior, immaterial organism as the counterpart of the external and material structure, or otherwise the organism could not grow into its specific form. This philosophy teaches that within each specific germ at the commencement of its being the perfect form and outline of the fully developed animal or vegetable species exists in its essential elements, or otherwise there could be no assurance in nature of the perpetuity and permanency of specific forms. Without this vital, interior organism in the very life-germ of specific beings as the immaterial pattern around which and through which the bioplasts weave their organic webs, there is no possible reason why the ovule of a sheep, for example, should not develop into a goat, and *vice versa*, since the two material ovules—not more than the hundredth of an inch in diameter—are found to be exactly alike examined under the most powerful microscope.

16. But it is objected by the critical reader that if the lower animal forms possess vital and mental organisms, as an immaterial but substantial counterpart of their material structures, then why are not all animals destined to an immortal existence after death, as well as in the case of man? This, doubtless, is one of the most serious and important questions ever discussed, and to be presented with all the explanatory and collateral reasons bearing on the subject would require the space of several entire numbers of the *Microcosm*. We shall, therefore, in conclusion, barely hint at the salient answer Substantialism gives to this problem.

17. Those religious philosophers who view every thing in nature as *spirit* which is antithetical to *matter*, or which is not material, as do the followers of Emanuel Swedenborg, having apparently formed no conception of the vast range of immaterial substances in the natural world lying between the domains of matter and spirit, would be totally at a loss to give any sort of rational answer to the foregoing criticism. It is certain that intelligent animals, such as dogs, horses, etc., have mental powers as well as vital force, and of course possess a mental and vital organism analogous to that of man; and it is equally true and rational that this interior organic structure is an immaterial but real substance. Those who believe it to be *spiritual* substance, simply because it is not *matter*, can

make no reasonable reply to the argument for the future conscious immortality of these lower animal tribes.

18. Substantialism on the contrary, has an answer. It teaches that the physical forces, such as heat, light, sound, electricity, etc., though substantial, are neither *matter* nor *spirit*, and that when these entities have done their work, they are relegated to the force-element of nature where they lose their individualized or specialized identity, and become a part of that universal fund or fountain of energy, there to be conserved and reproduced as needed in the different force-manifestations of the universe. It teaches the same thing with regard to the vital and mental forces of all lower animals and the vital force of all vegetable organisms. When a tree dies or is destroyed its vital force becomes a part of the general fountain of vitality from which it originally was drawn, and so with the vital and mental forces constituting the immaterial organic identity of every class of animals below man. Such substantial force, losing its animal identity, returns to the vital and mental force-element or fountain whence it came, having served the only conceivable purpose of its existence.

19. But here enters into the solution the factor of rational, self-conscious, spiritual force which alone draws the line of demarkation between the lower animals and the human form divine. This highest of all forms of force, which seems to constitute man an heir to personal immortality and to ally him to the great head of the fountain of all the spiritual forces of the universe, appears evidently to stamp upon its possessor, even while here, such an identity of being, that each human soul on leaving the body and entering the spirit realm must persist in individuality and find itself a god-like ego in the sense of an indestructible, self-conscious personality.

20. As Substantialism, aided by reason and reinforced by the self-evident necessity of things, is compelled to attribute the visible works and wonders of nature to the intelligence of that infinite immaterial personality we call God, there is no possible reason conceivable, why the highest of all His created intelligences on earth should not have been designed by their author for his own spiritual and personal associates in an eternal heirship and companionship. If man is not entitled to something as to personal conscious existence in another life to compensate for the ills of this;—in other words, if he is only on an equal footing in this respect with the irrational beasts that perish,—then why, Substantialism reverently asks, did an intelligent Creator make man but little lower than the angels, for so trifling a sphere of existence as this, while at the same time placing such an infinite and impassable gulf, without any apparent meaning, between him and the very highest of the lower forms on earth? If all are to be alike at death, notwithstanding the superior endowments and intellectual possibilities conferred upon man here, while only permitting a miserable brief companionship with reptiles, then truly the God of the universe may justly be chargeable with sublime and stupendous mockery.

[The following invincible statement of the true distinction between Substantialism and Materialism is from the pen of the eminent Baptist clergyman, Rev. John Crawford, D.D., who has taken the field as a lecturer in favor of the new philosophy. We learn that he is doing effective work for the noble cause he has espoused.]

[From The Canadian Baptist.]

## THE SUBSTANTIAL PHILOSOPHY.

"Why," says the atheistic Prof. Haeckel, in the triumphant style characteristic of this doughty scientist, "Why, if sound, light and heat—forces of nature, whose phenomena are so sensibly observed—are but the varied motions of material air and ether particles, as physical science inculcates, why have not I a right to assume and teach that mind-force, life-force and physic-force are also modes of motion of the material particles of the vibrating brain, and throbbing nerves?"

You are perfectly right, Professor; if heat is but a vibration of material atoms, if light is but a vibration of an imaginary ether, if sound is but the waving of atmospheric air, then the soul of man may be no more than the vibration of the throbbing brain, which ceases in death. But, if heat, and light, and sound are *entities*, not material, but *immaterial substances*, you cannot deny but the soul of man may be an entity also—an immaterial substance, which may exist when the material brain has ceased to throb until the resurrection morn!

Your atheism, Prof. Haeckel, is but the outcome of the materialistic science of the day, which, like all other false science, will have its day; but, in future ages, will be only known as a literary curiosity—a specimen of the air-castles of scientific dreamers.

This materialistic science, which is taught in nearly all our colleges, when imbibed, beclouds the minds even of our ablest thinkers. Take Dr. McCosh as an example. In his masterly work on "Divine Government," he gives the following definition of *life*: "Life may be defined as a system of arrangements, whereby the particles of matter, acting according to their properties, do, by means of absorption, assimilation, and exhalation, produce and develop certain forms, which continue for a time, and generate other organic life of the same species."

In another place he says: "We are inclined to regard the words organization and *life* as just general names for a most wonderful adjustment of physical substances to each other, for the production of certain ends."

If this definition be correct, life is a *nonentity*—a mere "adjustment of material substances"—"a system of arrangements"—arrangements of *material substances*!

If this be correct, Prof. Haeckel is sound, and his atheistical philosophy is true. If life be but a phenomenon, a result of moving organization, it follows that when the organization becomes deranged, and ceases to move, all that lives in man ceases. We cannot say ceases to *exist*, for, according to this definition, it never had any existence!

On the contrary, life, according to the Substantial Philosophy, is a real entity, an *immaterial substance*, not a mere phenomenon, or a result of organization; but, under God, the *parent* of organization. The material organization is the covering of the living soul, which it has woven for itself—a set of organs which it has fashioned in its own workshop, and for its own purposes, as long as it chooses to dwell in them, and use them. No arrangement of material substances, no physical organization, can *originate* life, but life, under God, can originate organization! The living soul forms the *fœtus* in the womb, it animates, repairs, and employs the physical organization in which it clothes itself. The bioplasts are but the thread in life's shuttle,

by which, under a divine commission, it weaves for itself a covering, that it may not be found naked; and when it leaves this organized clay, the abandoned tenement forthwith dissolves into mother earth again. This is the Substantial Philosophy in contradistinction to the "mode of motion" theories of the prevailing materialistic science of the schools of Darwin, Haeckel, Tyndall, Huxley & Co.

If this materialistic science dulls the mental vision of such able thinkers and champions for the truth as Dr. McCosh and Joseph Cook, what shall we say of the rank and file of scribblers in science, who, if their very life depended upon the effort, could not originate one scientific thought; but who follow with slow and measured tread in the footsteps of Darwin, Haeckel, Huxley & Co., parroting their profound philosophy, that neither heat, nor light, nor sound, nor, in fact, any of the forces of nature are substantial entities, but mere vibrations of material particles! And when the bold Haeckel advances another step in the same path of this materialistic philosophy, and affirms, with wonted confidence, that, as the other forces of nature are no more than vibration of material particles, so neither is the living soul in man any more than the vibrations of the throbbing brain, his humble followers have left them no other alternative but either to take with him the fatal leap into the cold arms of atheism, or retrace their steps, abandon materialistic philosophy, and plant their feet firmly upon the solid rock of Substantialism!

I am neither afraid nor ashamed to avow my belief, however it may provoke a contemptuous smile of some whose opinion is of small value, that there is no man in the present age who has done or is doing, more for the advance of true science, especially in its bearing upon revealed truth, than Dr. A. Wilford Hall, of 23 Park Row, New York.

I do not accept all that he has taught. He knows that I differ with him in one or two important topics; but take his Substantial Philosophy in its main teaching, and it is a mighty engine for the regeneration of science, especially in its relation to theology.

As our Lord has said, "A prophet is not without honor save in his own country," so may it be also said that a true scientific reformer is not without honor save in his own age.

But Dr. Hall's masterly teaching is taking firm hold of the thinking mind; and in future generations, the name of this remarkable man will shine in the intellectual heavens as a star of the first magnitude.

\* \* \* \* \*  
May God prosper this great and good man in his noble effort!

St. Thomas, Dakota. JNO. CRAWFORD.

## Key to the Main Arch of Substantialism.

*This whole Philosophy depends upon the correctness or the incorrectness of the Wave-theory of Sound.\**

BY THE EDITOR.

The main arch of the Substantial Philosophy, or the chief propositions upon which that system of doctrine is founded, are, first, that all the

\*An introduction to this article headed "The Wave-Theory of Sound" appeared in last month's issue, which every reader should re-examine in connection with this.



entities in the universe, visible or invisible, tangible or intangible, are naturally divisible into two great classes, namely, *material* and *immaterial* substances; and second, that all the forces of nature, or phenomena-producing causes by which our senses or rational faculties are impressed, belong to the second class; and instead of being modes of motion of material particles, as taught by modern science, are themselves substantial but immaterial entities, as real and objective as the air we breathe, the water we drink, or the food we eat.

This compound and comprehensive proposition covers the basic grounds of the Substantial Philosophy; and we here frankly declare, once for all, and proclaim it to the scientific world, as we have done before, that if these general propositions can be met and overturned by any process of reasoning, physical or metaphysical, we will publicly and unqualifiedly renounce Substantialism as without foundation in truth.

Assuming these propositions, however, to be true, it follows that heat, light, sound, magnetism, etc., instead of being the vibratory motions of some material substance, such as ether, air, or the particles of the steel magnet, must, as phenomena-producing causes or natural forms of force, be real, substantial, but immaterial entities. Hence, that *sound*, external to our sensations, is a substantial force, a real entity, instead of the wave-motion of the air constituted of so-called "condensations and rarefactions," and that the same conclusions also apply to the other forms of natural force named. Remember that sound, as defined in the very first answer given in our text-book, has two meanings, first, as an external force or objective cause, and second, as an internal sensation or subjective effect. Bear these elementary definitions always in mind and it will avoid much confusion.

Now it is universally conceded by physicists that the wave-theory of sound is the *foundation* mode of motion in physical science: in other words, that it is the first or original motion-theory, out of which have grown as legitimate offspring all other motion-theories of force, such as the undulatory theory of light, heat as a mode of motion, magnetism as the rotary vibration of the magnetic particles, etc. This being true, it follows, if the wave-theory of sound can be successfully overturned and the substantial nature of sound-force established on its ruins, that all other claimed modes of motion in physics which have grown out of the sound-theory, must fall by the same or similar processes of reasoning. Hence the overturn of the wave-theory of sound necessarily becomes the *key* to the main arch of the Substantial Philosophy, as well as the key to the situation.

But the advocate of the current doctrine of sound as set forth in all the textbooks and as taught in all the colleges, asks in surprise: Is it possible to prove that the wave-theory of sound is false? We answer, that it is not only possible, but that this universally accepted theory of science has already been proved to be false by a score or more of unanswerable objections, while it has also been shown to be laughably absurd, and in many cases ridiculous, by analyzing the numerous experiments and illustrations by which it is taught and claimed to be scientifically demonstrated.

These objections and arguments are to be found scattered all through *The Problem of Human Life*, the five volumes of *The Microcosm*, the first and second volumes of *The Scientific Arena*, and finally concentrated in the *Textbook on Sound*,

in which every phase of the theory is elaborately discussed. It is impossible, however, to give those arguments here, or even a small portion of them, in such limited space as our little journal affords. But we will now select a single objection to that venerable theory and present it concisely to the reader, that he may see for himself that this formal indictment of the wave-theory of sound, as false in science and false in fact, becomes a most serious matter, and one that should receive the immediate attention of every progressive and fair-minded student of science. And in advance of presenting this argument, we here make the offer to any professor or teacher that if he will meet it or show the slightest defect in its conclusiveness as an absolute over-turn of the wave-theory of sound, we will print his answer in this journal and publicly acknowledge its force.

The objection to the theory here referred to is as follows; and, as will be seen at a glance by every teacher and student of natural philosophy, is based upon the very foundation principles of acoustical science:—

The wave-theory teaches, as its central proposition, that *sound*, external to our sensations, consists of *air-waves*; that is, of "*condensations and rarefactions of the air*," and that, on account of the elasticity of the air, those condensed pulses travel, when formed and started, at the known or observed velocity of sound. The theory further teaches that the greater these condensations and rarefactions constituting a given sound, the *louder* must be that sound and the farther it will travel before the pulses die out or become inaudible. There will be no dispute about the correctness of this statement of the basic principle of the wave-theory, since Prof. Tyndall repeatedly tells us that

"The greater volume of sound heard everywhere throughout the room can only be due to the greater amount of motion communicated to the air of the room."

Again, he says:—

"We have already learned that what is *loudness* in our sensations, is, outside of us, *nothing more than width of swing, or amplitude of the vibrating air-particles*."—Lectures on Sound, pp. 48, 73.

This is the teaching of all physicists on this subject, and a hundred similar passages could be quoted to prove it. Hence, if the wave-theory of sound be true, it follows inevitably that the sounding body which vibrates farthest or causes the greatest disturbance of the air,—that is, which gives the greatest amplitude of swing to the vibrating air particles,—*should produce the loudest sound, and should be heard at the greatest distance*. On the contrary, if the wave-theory be false, and if sound, instead of air-waves, consists of pulses of *substantial force* radiating from the sounding body in synchronism with its vibrations, then it follows that the volume or loudness of sound should depend entirely upon the sonorous nature, quality, or property of the sounding body, *and without any necessary relation to the incidental disturbance it produces in the air*.

We repeat, if this substantial view of sound-force be true, and if the wave-theory be false, we would naturally expect to find some sounding bodies of a given size and of a given pitch which would produce very little atmospheric disturbance, yet which would produce sounds of great volume and intensity, *the very thing which does actually occur in numerous instances*. Whereas, if the wave-theory be true, and if the substantial view of sound-force be false, we would naturally

and of necessity expect that every vibrating body of a given size and of a given pitch or vibrational number, having the same amplitude of swing, would produce the same uniform loudness or intensity of sound, since it must of necessity produce the same condensations and rarefactions of the air,—*the very thing which does not take place in instances without number.*

Hence, we reach the irresistible culmination of these premises in the following general conclusion, namely: If we can, by careful observation, find certain sounding bodies which, at a given pitch, vibrate with large amplitude of swing, thereby causing great disturbance of the air, but producing almost no sound at all, and which sound is not audible a distance of ten feet in a still room; then again, if we observe certain other sounding bodies of the same pitch which produce an almost deafening sound while in close proximity, and which can readily be heard a mile away, *but whose amplitude of motion or vibratory swing is so slight as scarcely to be seen by the naked eye, and consequently which produces almost no motion of the air*, then it follows by mechanical, mathematical, and philosophical demonstration that sound does not consist of air-waves at all, and has nothing to do with atmospheric disturbance, as universally taught, and consequently that the present theory of acoustics hopelessly breaks down. Is there a logical and fair-minded man on earth who would not accept this general conclusion, provided the premises as stated were shown to be correct? We anticipate the answer of every reader, and say *No!* Then, for the overwhelming truth of the premises we give the following facts:—

A tuning-fork, for example, held in the fingers, or a wire chord stretched over rigid supports, when caused to vibrate at its best, and swing to and fro with an amplitude of a full sixteenth of an inch, *cannot be heard more than six or eight feet away in a still room*, notwithstanding the powerful condensing effect such large vibrations must have on the air; while a tiny locust, familiar to almost everybody in the United States, weighing not one hundredth part that of the fork or string named, and with a vibrational tremor scarcely visible even when in close proximity, as we have had the pleasure of observing, will sit on a green leaf, and issue sound almost deafening to the bystander, *and which can be distinctly heard more than a mile in all directions*, as Darwin himself admits in his *Origin of Species*. Thus a sounding body, with not one hundredth part the mass and with but a small fraction of the mechanical action on the air caused by the tuning-fork or stretched chord, actually produces a range of sound more than 800 times greater, and a volume of sound filling more than 80,000,000 times the cubical space!

Now, in the light of these facts, we assert in the most emphatic language we can command, that, in our judgment, no possible reply can be made to this argument against the wave-theory of sound, and thus by reflex logic against every other mode-of-motion theory in science.

We published this argument, substantially, more than three years ago, and sent copies of *The Microcosm* containing it to Professors Tyndall, Helmholtz, Mayer, Rood, Stevens, Tate, Rayleigh, and numerous lesser lights in our great colleges and universities, but the silence of the grave has reigned ever since on the subject, so far as they are concerned.

We are willing to suppose, naturally and charitably, that all those copies of our publication went astray, or surely some one of those high

authorities on acoustics would have replied, either exploding our argument so confidently presented, or else frankly, like honest investigators, confessing the objection to be unanswerable, and therefore that the wave-theory had fairly broken down. We will try the experiment again by sending this copy of *The Microcosm* marked, not only to the distinguished professors named, but to every professor of physics in this country and Europe whose address can be secured.

Now if this single argument, as here presented against the current theory of acoustics, be correct in its principles and facts—in other words, if it can not be successfully answered; then Prof. Huxley would say to physicists that they must give up the wave-theory as hopelessly overturned, since no amount of apparent reasons for its truth can offset one single consideration positively opposed to it. In fact, one such proof he says *"is worth as much as five hundred."* But as this rule of logic is so intrinsically valuable in the scientific discussions to which this journal is devoted, we here give the full text and exact language of that eminent English authority:—

"Every hypothesis is bound to explain, or at any rate not to be inconsistent with *the whole of the facts* it professes to account for; and if there is a *single one* of these facts which can be shown to be inconsistent with (I do not mean merely inexplicable by, but contrary to) the hypothesis, *such hypothesis falls to the ground*—it is worth nothing. One fact with which it is *positively inconsistent* is worth as much and is as powerful in negating the hypothesis as *five hundred*."—Huxley on the *Origin of Species*, p. 140.

The correctness of this rule of logic will not be questioned by any educated mind. We repeat, that no one has pretended to controvert the correctness and cogency of the argument here advanced against the wave-theory of sound, and hence the logical law laid down by Prof. Huxley exactly meets the case.

We do not pretend to assert that no scientific investigator has observed the fact here noted, that insects are capable of issuing sounds of great volume and that can be heard to a very great distance. They have, on the contrary, often observed this fact, but believing in the wave-theory, as they did, it is not surprising that they have made no attempt to solve the problem, since manifestly a true solution, had it been struck, would have annihilated that theory, as we have just shown.

One single exception to our statement, however, occurs. Daniels, in his great textbook, *Principles of Physics*, does actually state the problem and attempt a solution. At page 380 he declares that the reason why insects are heard so far away *is on account of the great number of vibrations they are capable of producing in a second!* But had this distinguished physicist thought for a single moment he could have known that the number of vibrations relates alone to *pitch*, and has nothing in the world to do with loudness or intensity; while it is a fact that the locust, which is heard further away than any other insect, *gives the loudest part of its stridulation at a key of less than 1000 vibrations a second!* Being totally in the dark, however, on the true nature and cause of sound, Daniels became bewildered by a mystery which can only be explained on the principles of Substantalism (not yet heard of by that scientist when writing his book,) and, as a consequence, he wildly mistook the true cause of pitch (rapidity of vibration) for that of

intensity! He never realized, in his confusion, that the number of vibrations which a sounding body makes in a second, as just intimated, relates entirely to its pitch, having nothing whatever to do with the loudness, volume, or range of its tone.

Had Daniels been aware of the true nature of sound, as a substantial but immaterial force, having no more to do with the amount of atmospheric disturbance incidentally produced by the sounding body than the substantial electric current has to do with the incidental disturbance of the air caused by the motion of the dynamo-machine, he would have realized that instead of an insect being heard a mile on account of its great number of vibrations, *some insects of the very highest sensible pitch produce tones so faint as not to be audible half a dozen feet away!* If the great number of vibrations in a second is the cause of the intense sounds of some insects, as this highest authority in physics declares, *why, then, are these insects, with the sharpest possible key, requiring more than 10,000 vibrations a second, limited to a few feet of range and intensity?*

The truth is, this very blunder of Daniels in attempting a solution by giving the well-known cause of *pitch* as the cause of *intensity*, is an absolute confession that our argument as here presented against the wave-theory of sound is unanswerable, and that the volume and loudness of the sound of the locust has nothing whatever to do with the disturbance which that insect is capable of producing in the air.

Gentlemen of the colleges—you who are teaching the current theory of sound as true science—it is but fair and honorable that you should at once meet this argument or publicly acknowledge the truth of Substantialism. Remember, we stake our whole philosophy upon this single argument, and we intend to hold the professors of physics throughout this country and Europe rigidly responsible that they shall either meet this demonstration or acknowledge their inability to do so.

#### ANOTHER COLLEGE BUILDING OFFERED.

Surely Substantialism ought to have a college as an educational nucleus from which, as a centre, to radiate the light and heat of this new and revolutionary philosophy. Dr. W. H. Chivers, of Colon, Mich., writes us that a large and suitable building in that town, owned by an aged and benevolent gentleman, will be donated for a college of Substantialism, and that the citizens of the place will put it in shape for its work, at a probable expense of \$2,000, if the friends of this cause will organize the institution and accept the donation. What say our readers to this offer? Could the editor fill two such important positions at one time as running the *Microcosm* (absolutely essential to the perpetuity of our cause), and managing a college of Substantialism in the live State of Michigan, he would gladly try his powers of ubiquity. But, really, there ought to be younger men of means and suitable ability to get up an immediate combination to take advantage of some one of such generous offers as have recently been made to the friends of the Substantial Philosophy. Let us say to generous old men who have means, and who believe in the grand principles set forth in the "Revised Creed of Substantialism," as printed in this number,—you will shortly have to give place to others, your wealth will be scattered and dissipated, and your names soon be forgotten. How much better while in life to set apart at least a portion of your riches (not to do injus-

tice to those dependent upon you) for a cause which will do so much good to the world in after generations, and thus achieve for yourselves and your posterity a lasting immortality here, as a prelude to ever-enduring immortality hereafter.

#### A SPECIAL REQUEST.

We beg of every friend of the cause which the *Microcosm* represents to read carefully and then study the "Revised Creed of Substantialism," as printed elsewhere in this number. If such friend shall then approve of the principles therein formulated and set forth, we pray him to call the attention of some doubting neighbor, and point out to him the value of such a substantial faith both for his present comfort and his future hope. Leave your own copy of this paper with him for study and reflection, and order another copy, which will be sent free. Let every substantialist resolve to become a home-missionary, and a noble work will be accomplished before this volume shall close.

#### SUBSTANTIAL MISSIONARIES WANTED.

If any reader thinks the *Microcosm* calculated to do good, and would be willing to do a little missionary work with the view of increasing our circulation, we will send him a bundle of copies free by mail, to be placed in the hands of thinking persons. Further, if the reader knows of a suitable person, who might like to take a regular canvassing agency for the *Microcosm* and our books, and will call his attention, we will send him a special circular holding out extraordinary inducements. Remember, this paper belongs to the entire Brotherhood of Substantialists, and is no more A. Wilford Hall's work than the work of A. W. Smith, T. R. Ford or a thousand other substantialists that might be named. True, the former is directly in charge of the work, and necessarily feels a weightier responsibility than can any single subscriber at a distance. But it must not be forgotten that he is really working simply for his board, every dollar over the most frugal expenses going into free sample copies.

#### PROF. THOMPSON'S BOOK.

Many readers of the unfriendly allusions to Substantialism in the *Christian Standard* and *Apostolic Guide*, have taken advantage of our offer last month and have sent us 10 cents for the December number of the *Scientific Arena*, containing our reply to Prof. Thomson's book. We have purchased a few more remaining copies of that number for those who wish to see both sides of this controversy.

#### SCHOOL-SUPERINTENDENTS.

We send a few copies of this number to school-superintendents, believing that of all men they are the most interested in the scientific work the *Microcosm* is doing. To any such official, who shall approve our efforts upon examination and will send us a list of the teachers in his district, we will mail a copy of our Textbook on Sound, which contains for educators a mine of information upon physical science nowhere else to be found. See last page of this number.

#### "PATMOS."—An Able and Interesting Volume, Especially for Ministers.

In one of the later numbers of the *Scientific Arena* we noticed a book called "Patmos," written by the Rev. E. R. McGregor, of Balston, Va., in which the Book of Revelations is subjected to the most critical, perhaps, and most comprehensive elucidation it has received since the day when St. John the Divine said "It is Finished."



At our request the Ms. of the work was sent to us by the author for perusal, and for several weeks, as we had leisure, we feasted intellectually upon one of the finest exegetical treatments of this difficult portion of the Sacred Scriptures we have ever seen, or, as we believe, that was ever written. So impressed and even fascinated were we with its explanatory classifications and analyses of the strange allegorical matters involved in this concluding book of the New Testament, that we have ever since been waiting very patiently for the publication of the work that we might renew the feast by a reperusal of the book in plain print. We are glad to learn by a letter received from the author that the book is now ready for the binders and will immediately be announced to the public. We earnestly commend it to every biblical student, whether clergyman or layman. Price, \$1.50. Address the author as above.

#### Rev. Dr. Crawford's Method of Lecturing.

We are receiving many inquiries in regard to the best method of presenting the Substantial Philosophy from the lecture platform, and have been urged to give in the *Microcosm* such suggestions as would help young beginners in this work. Up to the present time we have had nothing to suggest, out of the usual manner of lecturing, till we heard from Dr. Crawford, on his return from his recent extended and successful lecture tour through Dakota. The Doctor has no doubt struck the correct method. It is something like this: He presents to his audience a succinct but at the same time comprehensive outline of Substantialism, in a lecture of half to three-quarters of an hour, and then (with the understanding announced beforehand), invites questions from any in the audience who may fancy that they see difficulties in the way of the new philosophy. These objections are preferably sent up to the platform, written out on slips of paper to avoid the confusion of oral discussions on the part of some who might consume much time to little purpose. By answers to such concisely stated objections and impromptu inquiries the speaker is enabled to throw much light upon the general discussion, and to fill up the time in a much more interesting and profitable manner than by the common method of an unbroken lecture of any bearable length.

The speaker would thus be able to answer a dozen or more difficulties that might be uppermost in the minds of his auditors which would never occur to him in preparing his lecture, and by announcing such programme in advance it might induce many bright thinkers to attend the lecture who would otherwise stay away. But it must be remembered by any aspirant for the rostrum that no lecturer can expect to make a complete success of giving impromptu answers to such promiscuous difficulties unless he is thoroughly familiar with all the details of Substantialism, and has made this philosophy a part of himself by study. As an illustration of this method of presenting Substantialism in a popular lecture, we have invited Dr. Crawford to give our readers in the next number of the *Microcosm* one of his half-hour lectures, and also to give a specimen of the usual objections raised on such occasions, with his off-hand replies to the same. We anticipate a treat for our readers.

#### THE NEW HYGIENIC TREATMENT.

We are overwhelmed with communications from all sections of the country inquiring about the new volume on the "Art and Philosophy of Great Longevity, or, How to Attain Vigorous

and Youthful Old Age." Many of these correspondents urgently request some inkling of the *modus operandi* of the treatment in advance of the publication of the volume, that they may be taking advantage of its rejuvenating effects while the volume is preparing. To all these friends we say regretfully, that it would be impossible to give a true and proper conception of this hygienic system of treatment with anything less than the entire book, with all its details of discovery, reasoning, and experimental tests which go to constitute or make it up. We would be extremely happy if the volume were now ready, but the anxious struggle first to place *The Microcosm* on a wide and permanent basis, has overshadowed all other considerations, thereby unavoidably delaying the preparation of the book. Let every reader, therefore, possess his soul in patience, and the revelation will be forth-coming in due time.

#### Dr. Swander's Book on Substantialism.

DEAR DR. HALL:

I have learned from the Rev. Dr. Swander that he voluntarily offers to set apart for your personal benefit 75 cents (more than all the profits) from each copy of the "Substantial Philosophy" that shall be ordered of him from the subscribers to the *Microcosm* during the present year. This is very noble and generous on the part of that author, and shows his high appreciation of the aid he derived from your writings in the preparation of his book, a fact which he so heartily acknowledges in his Introduction. As it is a large volume (350 pages), and very cheap at the price—\$1.50—I have no doubt but many friends of Substantialism will gladly take advantage of this opportunity to place so important a work in their libraries, as a book of reference, for the double object of benefitting themselves and helping the editor.

In view of making this donation a thing of beauty and a joy forever, I have suggested to Dr. Swander to retain this accumulating fund till the 18th day of next August and then have it (at least all up to that date) invested in a gold watch and chain as a memento of our editor's 70th birthday. I purpose seeing to it, in the midst of my college duties, that several copies of the "Substantial Philosophy" shall be ordered with the view named, as I certainly want to be counted in on that memorable occasion. Those wishing to take part in the event will address the Rev. J. I. Swander, D.D., Fremont, Ohio, inclosing \$1.50, and receive by return mail the book referred to. I will see that a list of the names of all such purchasers shall appear in the *Microcosm*, Vol. VII, No. 1.

Respectfully, ROBERT ROGERS,  
Associate Editor.

#### HEAT AS A MODE OF MOTION.

BY THE ASSOCIATE EDITOR.

One of the modern theories of science which Substantialism has effectually attacked and completely overturned is that of "heat as a mode of motion." This teaching of all our physical text-books belongs not only in the same category with the wave-theory of sound, but, like the undulatory theory of light, is a necessary offshoot or outgrowth of the present motion-theory or wave-theory of acoustics.

As no other theory of sound except that of the wave-motion of the air was conceivable, even for centuries previous to the time of Sir

Isaac Newton, and as that great modern philosopher accepted and formulated the theory, making it a permanent part of physical science, it was conceived by Huygens and by later physicists as but the part of consistency that light, heat, and in fact all other forms of physical force, should rank in the same category, as analogous modes of motion of some kind of material particles. And as heat, light, magnetism, etc., defied all explanation, on the physical supposition of air-waves, upon which sound depended, even passing as they do through a vacuum with the same facility as through air, hence the necessity of an invention of another material substance for undulatory purposes called *ether*, so near absolute nothingness that its motions in producing light, heat, etc., could not be analyzed by which to contradict the theory.

Huygens was a genius, at least in a superficial way. He saw, if he should assume light and heat to be the motion of material particles of any ordinary substance gross enough to be tangibly analyzed and tested, as in the case of sound, the theory might be shown to be self-nugatory on its face. It was essential, therefore, to assume a material substance for undulatory purposes so far beyond human investigation that it could not be proved to be an absolute nonentity by his opponents, even if he himself could not prove it to exist. He therefore took his chances with an imaginary so-called material, *ether*, so much more attenuated than hydrogen gas that a million such atmospheres of it as surrounds our earth would not probably weigh a single ounce, rather than to accept Newton's theory of material light-particles shooting into our eyes from the sun at a velocity of about 180,000 miles a second.

That Huygens, in his superservicable attempt to set Newton right, was but a shallow inventor and critic, is manifest in the fact that he needed only to have substituted his imaginary material, *ether*-particles, for Newton's assumed grosser light-particles, thereby completely to have fortified the corpuscular or emission theory of the latter, without any wave-motion whatever; for surely, with a material substance so tenuous that "699,000,000,000,000" of its waves can dash into our eyes each second without damage to the vision, as the undulatory theory of light teaches, it is difficult to see why the same harmless substance, on the basis of light-emissions, should have been so deprecated by that eminent Dutch physicist. Nor do we exactly comprehend why Newton should so precipitately have shown the white feather at the first volley from the battery of Huygens, in taking shelter behind the undulatory theory of light when he could so easily have exchanged hypothetical material particles, and thus have kept his troublesome antagonist at bay.

We suppose, however, as before hinted, that they both saw the provoking inconsistency of having the sense of sight addressed by the emission of material particles, however tenuous, and the next sense below it—hearing—addressed by simple wave-motion. Hence, in their superficial extremity, they compromised on the undulations of imaginary material *ether* as a very sorry analogue of the "condensations and rarefactions of air."

But no sooner had this compromise been effected, and light declared to be undulatory motion, than the same inconsistency loomed up in connection with the theory of heat; for how could heat consist of emissions of any sort of

material particles and still in any manner be analogous to sound and light if the latter two phenomena-producing causes were mere modes of motion of material particles? As a consequence, heat also was soon forced into line as another "mode of motion" of material *ether*, and for a century physicists have been cudgeling their brains to discover data, analogies, and arguments favorable to that now universally accepted doctrine.

All this effort and laborious research, however, by which to harmonize these two undulatory theories of light and heat with that of sound grew out of the unfortunate fact that neither Newton, Huygens, nor any other scientist who has come after, has caught the true conception of the nature of the physical forces as immaterial substances. With such a basic conception of the physical laws, instead of laboring to harmonize light and heat with sound as a mode of motion, the wave-theory would have been abandoned at the very threshold of the investigation, and sound would have been looked upon as an immaterial but substantial force liberated from the force-element of nature through the vibratory action of sounding bodies of various kinds.

Then it would only have been necessary to abandon the gross material features of light and heat emissions as held by Newton, substituting for these immaterial but substantial force-pulsations, instantly to have brought order out of confusion and consistent truth out of incongruous error.

But it is manifest that the scientific age was not then ripe for such harmonious, consistent and revolutionary science. Ever since the time of Newton motion-theories have been gaining the ascendancy in our educational institutions, and to the same extent has materialism and scientific infidelity been obtaining the mastery over religion. With every new motion-theory of the physical forces introduced, and with every new phase of argument tending to confirm the truth of such doctrines, has the materialistic anaconda taken another coil around the very vitals of Christian philosophy, till religion was very near gasping its last, when Substantialism rushed upon the stage sword in hand and severed the monster reptile at a single blow by the novel and revolutionary announcement that every physical force or phenomena-producing cause in nature, including sound, light and heat, must, in the very necessity of things, be an immaterial substance. The scabbard of that sword has now engraven upon it, in letters of imperishable light, that every thing in nature of which the mind can form a positive concept, or that is capable of producing a positive effect, must exist as a substantial and objective entity, either material or immaterial, and that every motion-theory of modern science, is not only a radical error but an aider and abettor of materialism and a continual menace to all religion.

Thus, not only the physical forms of force, such as heat, light, sound, electricity, gravitation, magnetism and cohesion, but the vital, mental, psychical and spiritual forces, which move and control living organisms, and which, as analogues of the motion-theories of the physical realm, had been resolved by materialists into additional modes of motion, were, by the same master stroke of inexorable logic, converted into substantial but immaterial entities according to every principle of rationality and on every possible conception of the necessary relations existing between cause and effect.

For the first time in the history of science, *motion* was correctly defined as "position in space, changing," and therefore as an absolute nonentity which never produced any effect in heaven above or earth beneath, and which cannot, in the nature of things, be the cause of any result.

Substantialism, as originally based upon these elementary principles and definitions, thus struck an entirely new lead in the domain of physical and metaphysical philosophy, and the more elaborately it has been followed up and investigated, the more consistent and harmonious in all its ramifications has it become. The intellectual world is challenged to name any other philosophy or theory, ancient or modern, that can bear such a test. And yet Substantialism, thus triumphantly meeting all opposition and successfully answering every objection, is but in its very infancy. Practically, so far, it is the work of but a single mind, both in its inception and in its elaboration. Under these circumstances, what may not such a philosophy, with all nature for its resources, be expected to become and achieve? Let every educated and thinking young man try to answer this question, as he studies Substantialism and delves into its mines of hidden wealth, and we can assure him that the farther he advances the broader and more interminable will the vista become.

#### PRIZE ESSAY No. 1.

#### Interaction, Co-operation, and Counteraction of Forces.

BY REUBEN HAWKINS.

Will a cannon ball fired horizontally from an elevation, reach a given level through acceleration of fall in the same time required for it to reach the same level when dropped perpendicularly from the same height?

I shall try to prove that *science* is in error in the affirmative answer to this question, as given in the school books.

Two forces equal to each other in intensity and time of application, if applied to the same body in directions opposite to each other, will produce no motion;—applied in the same direction the motion (and momentum) produced will be double that which one of them alone would produce;—applied in directions at right angles to each other respectively (that is, in half opposition as to direction,) the motion (and momentum) produced in the diagonal direction will equal only that which one of them alone would produce in the same time in its direction.

Action and reaction will be equal whether the opposition as to direction be partial or total,—hence each force must bear half the loss. The loss in this case is manifested in the prevention of either force from producing full dynamic effect in motion. In other cases, as I shall try to make it appear, the loss on one side will be represented by prevention of dynamic effect in motion or normal acceleration, while on the other side actual retardation, or such tendency to retardation, as modifies acceleration will represent the loss.

If two forces of unequal intensity be applied during the same time to the same body, in directions at right angles to each other, the motion (and momentum) produced in the resultant direction will equal only that which the greater force alone would produce in the same time in its direction,—hence the mutual loss dynamically will equal the effect which the weaker force alone would

produce. It is only necessary to refer to planetary orbital motion (in which it is assumed by scientists that gravity is cancelled dynamically by the so-called centrifugal force,) to prove that the cancellation (at right angles only) equals the weaker force.

Gravity in its action on a planet, supposing the orbit to be circular, is at all times half negative, so to speak,—causing retardation in the constantly changing tangential direction,—and half positive in causing motion in constantly changing new directions—the motion in new directions equaling dynamically that which is lost in old directions.

In considering planetary motion as we find it, in elliptical orbits, mean values have to be used, as the preponderance of the positive and negative effects of gravity (on account of change of angle of gravital pull with relation to direction of motion,) alternates—causing actual accelerations and retardations.

The foregoing statements of *fundamental principle* appear to me to be self-evidently true; and I think their truth will be readily perceived by any one whose mind is itself in mathematical equipoise. *If these principles are not true why not?* If true their application to bodies in motion is well nigh universal, the only exceptions being in case of bodies moving in the exact direction of predominant gravital attraction, or in the opposite direction.

It appears to me to be unphilosophical as well as mathematically incorrect to assume that gravity (in the mean results of its action) is totally cancelled dynamically in its action on planets and satellites,—that its effect is to bend momentum so to speak,—and yet to assume that the increasing rate of departure from a supposed tangent under this bending process represents dynamically such full acceleration of fall as the same intensity would give without the partial opposition of lateral motion. *If both forces (gravity and momentum) produce full dynamical effects actual acceleration is a necessity mathematically.* But to the ball problem:

The momentum of the ball would be many times greater in intensity than the action of gravity tending to depress it, and were its velocity very great, and atmospheric resistance removed so it would not retard on that account, the ratio of acceleration of fall would not vary much from that which the half intensity of gravity would give without the interference of lateral motion.

In practical gunnery any given problem involving these principles must necessarily be almost infinitely complex mathematically. The conditions necessarily involved (leaving out atmospheric resistance), would include initial velocity and its proportion to gravital intensity (involved in the time necessary for gravity to cancel all lateral motion and establish normal ratio of accelerated fall perpendicularly), constantly changing angle of gravital pull with relation to the direction of motion as the ball curved downward, and the angle of initial projection with relation to the direction of gravital action.

Hence only an approximate estimate of the ratio of acceleration of fall can be made in any given case of projectile motion; but in no case would the projectile fall with the normal ratio of acceleration for falling bodies so long as it had any lateral motion.

It may be asked: If this be true why will not gravity speedily overcome by partial opposition, the motion of a cannon ball rolled slowly on a level table? The answer is not far to seek. The



table by *total opposition* cancels gravity dynamically—action and reaction being equal. Let the ball roll off the end of the table and gravity will speedily cancel its horizontal momentum, and it will assume the direction of perpendicularity in its fall after describing a very short curve.

This proves the cancellation of horizontal momentum by gravity. Were it not cancelled the ball would describe a straight line resultant in its descent instead of curve when leaving the table. Gravity being unlimited (except as to mode of action) in static reserve, and working continuously without any loss to itself in active energy on account of work performed, acts promptly and continues to act after opposition is removed; while momentum, having no static reserve, must be speedily cancelled by the total or partial opposition of gravity; and were its losses in old directions not compensated by motion in new directions given by gravity, momentum would be lost entirely.

Designating, for purpose of illustration, that action of gravity which causes motion, acceleration, or change of direction of motion (change of direction is motion in new direction) as *positive*, and that which causes retardation, or such tendency to retardation as reduces ratio of acceleration, as *negative*, the key to the formulation of the laws governing its action on bodies in motion in the different angles of direction with relation to the vertical may be stated as follows:

On bodies moving vertically, upward, gravity is wholly negative in its action: downward, wholly positive:—dividing the half circle into 180° numbered from the vertical—the positive action of gravity on bodies moving on any given angle will be as the angle is to 180, and the negative action in each case will be the complement of the positive—180 representing total gravital action.

Of course in practical gunnery the ball only starts on a given angle, and a continuous change of angle in an increasing ratio follows. In orbital motion the conditions involved are much less complex (where simple circular motion is considered) and the application of the principles governing the composition of forces is comparatively easy and simple.

In orbital motion gravity is effective, *positively* in causing change of direction or motion in new directions, only to the extent of half its intensity.

Direction of motion is reversed by gravity (in circular orbit) by cancelling all motion in one direction and giving an equivalent in the opposite direction in one-half of the orbital period—*uniformity of velocity being maintained during the process*. The full work performed by gravity—positively and negatively—in this process is double that which would be performed in reversing direction and restoring velocity, supposing gravity of same uniform intensity, without the opposition of lateral motion, to be applied first to the cancellation of all motion (in a straight line) and then to restoring it by acceleration.

The mean velocity and momentum during the process in the latter case would be but half that which is maintained in the orbit. Hence the work performed being but half that which is performed in orbital reversal of direction, the time required to perform it would be but one-half, or one-fourth of the orbital period. Hence the further conclusion, that gravity acting uniformly with the intensity which it has at orbital distance, without the opposition of lateral motion, would give a planetary body by acceleration from a state of rest, a velocity in a

straight line equal to its mean orbital velocity in the time of one-eighth of its orbital period.

The real analogy and proportionate intensity of gravital action on a body in orbital motion as compared with the intensity manifested by acceleration of fall at the earth's surface is found—not in the increasing rate of departure from a supposed tangent, but in the rate of orbital motion as proportioned to orbital circumference.

The terms *positive* and *negative* are used in this essay in a special relative sense, to illustrate principle.

Retardation in the absolute sense, is as much a positive effect of gravity as is acceleration.

The mean equality mathematically between the degree of curvature in orbital motion on one side and gravital intensity on the other is not denied.

It is the philosophy of the process, and its bearing on collateral questions which it is my purpose to try to elucidate.

Force—such as tends to cause motion of mass—acts in straight lines—hence the tendency of bodies to move in straight lines. Curved motion can be produced only by two or more forces acting in partial opposition. In the composition of new forces, or forces in new directions, through the action and reaction of opposing forces, there is necessarily a dynamic loss by cancellation, and this loss must be equally divided if it is true that action and reaction are equal.

Chillicothe, Mo.

[The foregoing article from the able pen of Mr. Hawkins was written substantially before our Prize offer was published. Hence, the length of the article is exceptional. From its highly scientific character, however, and the fact that this number of the *Microcosm* will reach more than 20,000 professors and teachers, we deemed it important to give it the position of Prize Essay No. I. We have also an excellent article from the pen of Mr. D. James, on "Substantialism versus Motionism," which will appear next month.—EDITOR.]

#### One of the Christian Standard's Compliments to Substantialism.

[From The Christian Standard, Cincinnati, O.]

"I have received from you a copy of Prof. Thompson's book 'Evolution of Sound Evolved,' and have read it with interest. The book which is reviewed [the Problem of Human Life] is a piece of preposterous stuff, having not a redeeming feature in it. Its so-called facts are not facts, but fancies; its reasoning is but verbal jugglery, and its conclusions not worthy of the least attention. It was written with an animus, and put before an uncritical audience, and followed up with so much newspaper vim as to disastrously affect large numbers of persons. For this reason alone it was worth the while for some one to meet the pretensions of the book by showing up its absurdities, its sham facts, its dishonest dealings with history and with men. Prof. Thompson has done this in a way that pleases me, and is quite appropriate to the work to be done. He can mix as much satire with his ink as Hall can, and knowing something about the subject while Hall did not, he has punished the latter as he richly deserved. It will be a pity if every one who has been interested in this matter does not have an opportunity to read this book. It is to be presumed, though, that many who have taken sides will not have the courage to do so. As for Hall himself, it is not likely that he will recover his sanity in this life, but the community interested in him may be reminded that Don Quixote came to his senses after he had retired from his adventures and Rozinante was in his stable."—A. E. DOLBEAR, College Hill, Mass.

#### REMARKS BY THE EDITOR.

We copy the above as a mere specimen of the bitterness felt toward our efforts to teach and spread the Substantial Philosophy, on the part of the management of this pretentious "Christian" journal. The origin of this feeling on the part of the *Standard*, as many of our

readers know, dates back several years when it became our duty to expose in the *Microcosm* the absurd scientific teaching of that paper concerning the fall of the moon from its tangent. Up to that time, the *Standard* was exceedingly friendly toward our work, speaking in unstinted praises of the "Problem of Human Life," which this superficial and supercilious Dolbear now calls, with the *Standard's* solicitous approval, "a piece of preposterous stuff, having not a redeeming feature in it."

In contrast with this denunciation we here give what Isaac Errett, the Editor in Chief of that paper, wrote at the close of a long review of the "Problem" as printed in the *Standard* previous to our gravitation episode:

"The scientists who have dealt so flippantly with the solemn questions of spiritual and divine existence, and talked so vauntingly of their scientific demonstrations, will find that they have caught a Tartar. We cordially commend this work to our readers for earnest study."

These unsolicited words of approval breathe the same Christian spirit as do hundreds of other notices of the "Problem" from the religious and secular press of this country and Great Britain, a sample of which is given in this number on page 31. Yet this obscure, malicious, and benighted Dolbear, because solicited to do so by those disgruntled publishers, and because he would thereby gain the favor of a powerful religious journal, strips himself of every vestige of personal integrity and repudiates every claim to the respect of mankind by denouncing a book devoted solely to a defense of religion against materialistic infidelity as "dishonest," "not worth the least attention" and "a piece of preposterous stuff having not a redeeming feature in it."

Now this Dolbear, without a reasonable doubt, has never read the "Problem of Human Life" nor anything quoted from it except the miserable misapprehensions and misrepresentations scattered all through Prof. Thompson's book; and he is therefore just as oblivious to our real views and teachings as was Prof. Thompson himself when he coolly represented Substantalism as teaching that *sound consists of the material particles of the bell or other sounding instrument sent off through the air by its vibratory motion!* And this prodigious exhibition of stupidity or something worse on the part of that author is actually quoted and indorsed by the *Standard* as proving that "Substantalism, after all, is but an old and long-since exploded doctrine!"

Cannot some personal friend or acquaintance induce this susceptible caricature of a professor from College Hill, Mass., to read our article in this number entitled "The Key to the Main Arch of Substantalism," and thus help him to catch a glimpse of the wave-theory of sound disappearing in a cloud of blue smoke? We hope some student of his, should any young man chance to be so unfortunate, will pin him down with that article like a snake under a forked stick, till he will either answer its arguments or shut up about the wave-theory of sound and Prof. Thompson's book. If he has the "courage" which he so tries to disparage in others, he will, before being inveigled into writing another indorsement, read our reply to Prof. Thompson's book as printed in the December number of the *Scientific Arena*, a copy of which we send him with these remarks; and we add here that many of those who have seen that book are making haste to send for our reply as per offer last month. In this way, thank Heaven

for the *Microcosm*, we hope to spread the antidote as widely as the *Standard* is trying to spread that poisonous tissue of misrepresentations.

In conclusion, we ask the reader to weigh the quotation we have just made from the pen of Isaac Errett as well as those from other religious journals referred to, and note the candid Christian spirit of their unsolicited estimates of the "Problem," and then judiciously to compare them with the present vengeful attitude of the *Standard* and the vituperative spirit of the letter from College Hill, and we predict that he will have little difficulty in viewing this Dolbear as the continental calumniator of America, and the *Christian Standard* as *particeps criminis* with malicious intent both before and after the fact.

We will only add, from information we have received, that Eld. Isaac Errett has had nothing whatever to do with these uncalled-for attacks upon Substantalism in the *Standard*. It is chargeable, as we have proof, entirely to his subordinates. We are glad to make this correction, as we have always had the profoundest respect for him both intellectually and personally.

#### REMEMBER THESE ITEMS.

1. Any library or reading room will be supplied with the *Microcosm* at 25 cents a year. We thus donate one-half for the general good. What educated man will remember his *Alma Mater*, and donate the other half?

2. All subscriptions must begin with the volume, or with the December number. One man writes: "I already have the first number, so please begin my year's subscription with No. 2." He forgot that No. 1 did not cost him anything.

3. Send money in any convenient way; for large sums,—bank-checks, money-orders, express-orders, or registered letters are perfectly safe. For small sums,—postal-notes are preferred, but postage-stamps will do when more convenient to the sender.

4. Remember that any person who may think it possible to work up an interest or raise a club of subscribers will receive a bundle of copies free to place in the hands of willing readers. Every dollar of the proceeds of subscriptions during this year will go into copies for free distribution. Let each subscriber think of this, and try to add a few more paying names.

5. A postal card costs but one cent. Write down the names of any friends you may know at a distance and send to us. We will cheerfully send them sample copies free.

6. We purposely send an extra copy of this number to a few subscribers as a hint that they hand it to some intelligent friend with a request to read it. Such kindly acts will be duly appreciated.

7. Any person who will send us a club of names of twenty-four subscribers at one time, with the money (\$12), will receive by express a complete set of our "Scientific Library" of eight volumes, worth \$11 (cost price \$5), as a premium. See last page of this number. If these books are to be sent by mail, which as a rule will cost less, \$1.25 in addition should be inclosed to prepay postage. This offer will enable any minister to own this valuable set of books, by inducing twenty-four of his parishioners to subscribe for the *Microcosm*.

8. Next month the Wave-Theory of Sound, and Heat as a Mode of Motion, will be crushed out more effectually than ever before. Let those interested in the perpetuity of these popular theories of science prepare to stand from under.



## THE PROBLEM OF HUMAN LIFE.

A Subscription-Book for the Times.

Invariable price, \$2.00. Sample copy, (post-paid,) by mail.

No book on religio-philosophical and scientific subjects has proved of such spontaneous demand as this. More than 66,000 copies have been sold since it first appeared, about ten years ago, and without one dollar's worth of advertising—merely by one person telling another of the literary treasure he had discovered. The work is even now in more exciting demand than when it first appeared. It literally "grows with its growth and strengthens with its strength."

We want an agent in every county in the United States and Canada, and will positively give canvassers every penny over the actual cost of producing the volumes, alone for the good the book is calculated to do. With this work and the *Microcosm*, almost any agent can make excellent pay. Write us for special terms for both book and paper. No book ever published has been so favorably and enthusiastically noticed by the press.

Here is a mere specimen out of hundreds of volunteer press-notices.

## "A Masterly and Triumphant Refutation."

[From *The Christian News*, Glasgow, Scotland.]

One of the most trenchant and masterly opponents of this theory (Darwinism) is Dr. Wilford Hall, of New York. Some time ago he wrote a book entitled *The Problem of Human Life*, in which he subjects to a searching and critical analysis the strongest arguments in favor of evolution advanced by Darwin, Haeckel, Huxley, and Spencer, the acknowledged ablest exponents and advocates of the system. Never, we venture to say, in the annals of polemics, has there been a more scathing, withering, and masterly refutation, read or printed. Dr. Hall moves like a giant among a race of pigmies, and his crushing exposures of Haeckel, Darwin & Co. are the most sweeping and triumphant we have ever read within the domain of controversy. If our thoughtful and critical readers have not yet read the book, we venture to prophesy that they have a treat before them.

## "The Book of the Age."

[From *The Methodist Protestant*, Baltimore, Md.]

This is the book of the age, and its unknown author need aspire to no greater literary immortality than the production of this work will give him; and thousands of the best-educated minds, that have been appalled by the teachings of modern scientists, will "rise up and call him blessed." Hitherto it has been the boast of atheistic scientists that the opponents of their doctrines have never ventured to deny or to solve the scientific facts upon which their theories are based. But our author, accepting these very facts, unfolds another gospel; and Tyndall, Darwin, Haeckel, *et al*, are mere pigmies in his giant grasp.

## "The Most Startling and Revolutionary Book."

[From *The Brethren at Work*, Mount Morris, Ill.]

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When the discovery was first made and the treatment first adopted by the author, he was reduced by a gradual decline to almost a skeleton, and was given up by his physician to die of consumption,—his younger brother, Samuel, having just been carried off in that way. The persistent application, however, of the new treatment from that time to the present, has gradually raised him to his present permanent condition and weight of 225 pounds of the firmest flesh, as he believes and as others admit, possessed by any man of his age living.

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"\* \* \* \* \* Nearly twenty years ago in this city Dr. A. Wilford Hall gave me privately a detailed history of a hygienic treatment he had discovered and adopted some twenty years before, and which he had practised continuously upon himself up to that time. This history included an account of the failure of his health, the reasonings and conclusions which led him to adopt the treatment, his rapid restoration to health, &c. From the time of his first mention of it to me I have been entirely satisfied that it saved him from a lingering consumption and death; and that in the years following, as I have evidence to satisfy me, its continued practise has so affected the nutrient and eliminating functions as to give to his physical structure a greater degree of solidity, or in other words, a higher specific gravity than that possessed by any other man living. I learn that he has persistently continued the treatment to the present time—forty years in all—and that his present health and vigorous condition may rightfully be compared to the 'bloom of youth,' though he is nearly seventy years of age. The tests I have made of the treatment upon myself and in my practise in the twenty years past, have convinced me that great practical benefit may be derived by members of the medical profession and others from a careful study of the rationale of the treatment as discovered by Dr. Hall, the details of which he proposes to give in his forthcoming book. A debt of gratitude will surely be due him for whatever scientific advances he may be able to unfold in the line of assisting nature to ward off disease, and in the restoration of health.

R. F. STEVENS M.D."

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[From the Arena.]

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# The Microcosm

A MONTHLY JOURNAL OF SUBSTANTIALISM AND COLLATERAL DISCUSSIONS.

THE ORGAN OF THE SUBSTANTIAL PHILOSOPHY.

A. WILFORD HALL, Ph. D., LL. D., Editor and Proprietor.

(Author of the "Problem of Human Life," "Universalism Against Itself," Editor of the *Scientific Arena*, &c., &c.)

ROBERT ROGERS, S. L. A., Associate Editor.

Address all communications to A. WILFORD HALL, 23 Park Row, New York.

Vol. VI.—No. 3.

FEBRUARY, 1889.

50 Cents a Year.

Entered as second class matter at the New York Post Office.

## INCONSISTENCY OF THE MOLECULAR THEORY.—NO. 1.

BY THE EDITOR.

Modern science teaches that all material bodies are constituted of molecules; that these molecules are normally separated many times their diameters apart—in air not less than 2500 times; that they are constantly in rapid oscillation, vibrating at enormous velocity hither and thither, in all conceivable directions, their velocity in air being about 1500 feet a second; and that they never touch each other only as they chance to come into collision one with another by this incessant bombardment.

But what is it that gives the molecules of the solid steel magnet, for example, their vibration, which, according to Sir William Thomson, constitutes the "mode of motion" called *magnetism*? Or what is it that gives them another velocity and direction of swing to constitute the "mode of motion" called *heat*? This is a question physicists do not pretend to answer. If pressed by the logical investigator for some sort of an answer, they admit that every effect ought to have a cause, yet these motions of the steel molecules they virtually assume to be without a cause, since the *force* of magnetism and the *force* of heat—as modes of molecular motion—are constituted of the very motions themselves; and as the motions of the molecules can not be the force which makes them move without being both the cause and the effect of themselves, it follows that modern science at the very initial stage of its investigation of inert matter stultifies itself with a most absurd self-contradiction.

To say that these material molecules were always in motion is to contradict the normal and self-evident condition of all matter, which is a state of *rest* instead of a state of *motion*. We prove this by our senses in observing bodies of every kind large enough for human investigation. Unless a cannon-ball is caused to move by some extraneous force mechanically applied, it will remain quiescent forever. This we can readily see. If it is moved or displaced by heat, by gravity, by the cycling motion of the earth, by the explosion of gunpowder, or by any other mechanical force, then that force is the cause of its motion, while the motion itself is the effect of this *applied force*, as a child can comprehend.

Physicists who believe in the molecular theory, and who claim that the molecules of

all bodies are in a continual state of motion, can not offset this argument, based on the normal state of rest of all material bodies, by the assumption that the cannon-ball is really in a state of motion among its invisible particles. This is only one assumption without proof with which to prove another. Molecules are separate masses, according to that theory, as much so as cannon-balls, only smaller; and if the normal condition of a cannon-ball, as a mass, is rest, then that of any smaller mass is also rest, of logical necessity. If molecules, as separate masses, move normally and without extraneous mechanical force, hundreds of feet a second, then cannon-balls should do the same as separate masses, and just as *bodily* as do molecules, and to proportionate distances.

If the normal condition of matter is that of *motion*, as it must be to sustain the molecular theory and give color to the assumption that all matter in its finest particles is in constant oscillation, then plainly, a mass of two molecules stuck together ought to move at distances and velocities in proportion to size; that is to say, a mass of two molecules of air, cohering, ought to travel at a velocity of 3,000 feet a second, instead of 1500. Indeed, if motion is the normal condition of matter, the greater the quantity of matter, the *greater* should be the amount of motion instead of the *less*. It is so with all normal conditions of matter. Weight, for example, is a normal condition of matter; hence the more matter the more weight all the time, other things being equal. If there is any truth in the theory that it is normal for small particles of matter to move, then larger particles should manifestly move faster, until cannon-balls would outstrip the speed of light, instead of lying still.

How plain, then, that *rest*, instead of *motion*, is the normal condition of matter! The larger the quantity of matter, the more stability, the more rest, because the less liable to be moved by extraneous force which is the only means by which matter, large or small, can ever cease to be in its normal state of rest. We thus block the game of assumption at the very start on the part of molecular theorists. We will allow them to assume if they wish that molecules exist, for that is comparatively a harmless fancy; but when they assume that these molecules are moving with the speed of rifle bullets by an inherent property of matter, the reverse of inertia, we stop them right there, and deny the right of such assumption. They have entrenched upon the substantial domain of force, which alone is the



cause of motion, or change of position in matter, whether it be a molecule, a mole-hill, or a mountain.

Thus we demonstrate by ocular inspection of material bodies which we can see and feel and weigh and measure that the normal condition of all matter is *rest*, as implied in the very property of *inertia*, while motion is the abnormal condition, produced by some extraneous cause, since no inert body can either start, stop, or change its own motion. In view of this fact, the attempt to put the real problem in the case still farther away by reducing the size of our cannon-balls to these so-called molecules, and then declaring them to be always in motion, is to assume imaginary facts as the foundation of a grave scientific theory at the expense of reason and common sense.

When this view of matter, force, and motion is pressed home to the advocate of the molecular theory, he will tell you that the motions of the steel molecules are probably kept up by the changes of temperature constantly going on in all bodies around us, and that these changes of temperature result from the varying force and velocity of the collisions of the intermolecular *ether*-particles, which material substance, this theory tells us, surrounds and envelops the molecules of all solid bodies, and that the various motions of these *ether*-waves thus constitute *heat* as a "mode of motion," as well as *light*.

Now can not these profound physicists see that in thus seeking to find an adequate cause for the movements of the steel molecules in this bombardment of intermolecular *ether*-particles, they meet the same difficulty precisely as before in having no imaginable cause for this *etherial* motion which causes the steel molecules to vibrate. Possibly the little *ether*-molecules are in like manner knocked about as the effect of the bombardment of the inter-*etheric* atoms of "ozone of the seventh order of differentiated luminosity," *a la* Keely, and then again that the little atoms of ozone in like manner are knocked into their vibration against the *ether*-particles by the interzonic missiles of some other material substance still more attenuated than ozone, until finally we get down to something so far out of reach even of the imagination that it will manifestly move without any cause whatever! And thus we come again to Dean Swift's profound conclusion, based on this very molecular "house that Jack built," that

"There never was a flea so small  
But had other fleas to bite 'im;  
And these again have lesser fleas,  
So on *ad infinitum*."

The truth is, scientists who have precipitated themselves into this theory of bombarding molecules and atoms, in order to try to harmonize the observed phenomena of science with the materialistic doctrine that the whole universe is constituted of but *matter* and *motion*, can now gracefully escape from their network of incongruity by accepting the beautiful, consistent, and harmonious system of Substantialism, which makes all motion the non-entitative effect of applied *force*, and all *force* an immaterial substance and a delegated agency with its powers to move matter derived from the primordial fountain of all *force*—the infinite and intelligent First Cause of all things.

But no; such a consistent, theistic view of

Nature's harmonious order of things smacks too much of religion, or "poetic faith," as they call it, for the mighty intellects of such materialists as Haeckel, who want no nonsense about an allwise God mixed up with their molecular science! They prefer to butt their sapient heads against the first bombarding molecule their imaginations can conjure up, and then stand there utterly confounded as to what makes that molecule move, thus bewildering themselves with millions of infinitely unsolvable problems in a single grain of sand, each equal in point of mystery to that of admitting a personal and intelligent God, the admission of whose existence would account satisfactorily for every inexplicable fact in the universe!

A man who will accept an infinitely mysterious and inexplicable moving molecule, which view involves countless millions of similar mysteries in everything he touches, a fact which his mind is forced to acknowledge according to his theory, and who will still refuse to accept the one single mystery of an infinitely incomprehensible God, which solves every other problem in Nature, exhibits a degree of scientific puerility and inconsistency of which no English adjective can express the enormity. The "poetic faith" which enables a man to believe in the molecular theory of present science ought to qualify him for accepting polytheism of the most heathenish brand.

But our argument showing the inconsistency of the molecular theory is not yet anywhere near its culmination.—(Continued in next number.)

#### PRIZE ESSAY, No. 2.

##### Substantialism versus Motionism.

BY D. JAMES.

The wave theory or motion theory of force is scientifically objectionable.

I. Because it requires two postulates—matter and undulations—when a single postulate of active immaterial substance is sufficient.

II. If heat is an effect of agitated material and universal *ether*, the quantity of heat in the universe ought constantly to increase, because the source according to the theory is always active. If a constant agitation of the *ether* produced heat, the temperature of the ocean would constantly rise but for radiation. The *ether* ocean has no where to radiate, hence should get hotter and hotter.

III. Since all the diverse manifestations of force, or force in its different forms, are often observable in the same place and at the same time, we must suppose as many distinct systems of *ether* undulation to occur at the same time and place, without the slightest mutual interference, which is an impossible supposition.

IV. Light being a composition of seven different elementary rays, we must suppose that seven different and distinct systems of waves can be so united or combined, that they may be afterwards separated without alteration as to size, etc.—another impossible supposition. Regarding white light as a composite substance consisting of seven different elementary substances, there is no difficulty in the case, since even the material world presents a great number of analogous cases.

V. Waves are not reflectible in any proper sense of reflection. If they were, there is no telling what angle the reflection would take, as that would depend upon what point in the curve of the wave-form would happen to strike the reflecting surface.

VI. Vision is inexplicable by the wave-hypothesis; for it is impossible to conceive how the delicate outlines and features of an object can be copied by waves and conveyed to the eye, when there are so many disturbing impediments and counteracting obstacles on the route. The eye can have no other sensation, in this case, than that of *motion*. Just think of *red motion*, *green motion*, etc! Then think of brown motion, gray motion, etc., as a combination of many other motions!

VII. Photography is also unexplainable on the hypothesis that light is but the motion of matter, for it is simple nonsense to suppose that *wave-motions* are subject to the chemical action of acids, etc. Photography necessarily requires light to be a substance in order to be acted upon chemically, and permanently affixed to a plate.

VIII. Since the different colors of the solar spectrum are each dependent on waves of definite size and length, a combination of red and green waves ought to produce an average wave, the originals being destroyed. If white light is focused by a sun glass, heat is produced. Therefore, the light-waves are converted into heat-waves.

IX. The undulatory theory contradicts that common sense by which light is regarded as an objective immaterial entity. The continued motion of a cannon-ball, for instance, requires a *motive force* to accompany the ball to keep it in motion. Force must have an objective existence independent of the motion it gives to a moving body.

X. We can not suppose that the material ether circulating in the cannon-ball moves the ball by the agitation of itself or the undulation of the ball's particles. The term *motion* is used to express the change of position in space which is characteristic of a moving body. The word *motion*, therefore, can not mean the cause of the motion.

XI. That an inert body can not move itself, is a well-known truism. Inertia is only another name for weight; therefore, force which produces weight must be an active agent, having an objective existence. Waves, therefore, can not be made to explain the motion of a cannon-ball, because the waves themselves can no more move without extraneous force than can the ball. The ball can not continue in motion of itself, and the motion can not be attributed to inertia, for inertia is a *property of matter when subjected to gravity*. Remove gravity or weight and inertia vanishes.

XII. Finally, since all tangible and acknowledged substances, from the densest to the rarest, are strictly subject to the law of reflection when striking the surface of a stationary body—the angle of reflection being always equal to the angle of incidence—and, since light, heat and sound always obey the same law, the conclusion is inevitable, that they are also substantial entities. The reflectibility, refrangibility and condensibility of the forces are easily explainable upon the substantial hypothesis. The wave theory, on the contrary, simply masses difficulty in every case,

and renders an intelligible or rational explanation of force wholly impossible. It is only another instance of the futility of the *a priori* process of reasoning, and the sooner it yields to the simple, common sense teaching of Substantialism, the better for modern science.

XIII. The word *motion* is improperly used in physics. We are told that "momentum is the quantity of motion" of a moving body, etc. This is an absurd statement. "Momentum" is the measure of the stored up motive-force of a moving body. When a catapult hits a wall, its motive-force is transferred to the wall, and this is what causes the wall to move. The catapult, if gravity were removed has no weight, no moving inertia. Hence, man uses gravity to assist him in the case of all mechanical results.

XIV. Since all space is equally occupied by this undulating ether, within as well as without material bodies, according to the current theory, no kind of material substance ought to affect light or heat in any way, or in any manner interrupt or divert its rays. The ether ought to agitate or undulate inside of a material body just the same as outside, and there should be no such thing as opacity even in a block of coal. Fogs and clouds ought not to diminish light or heat, or intercept them at all. The man in a dungeon, or the diver at the bottom of the ocean, ought to see as well as the one on the surface of the ground under a clear sky at noonday. Refrangibility, reflectibility and condensibility ought not to be the properties of a mere wave effect produced by agitated ether. As matter presents no obstruction to the ether itself, why should its waves be affected by material bodies in any way? But since the substantial cloud intercepts light, the conclusion is unavoidable, that light is substantial also. Light, heat and sound, as immaterial substances, can be refracted, concentrated and reflected just as material substances can, and we are compelled therefrom to conclude that they are substantial entities.

XV. The wave theory ought to permit gravity as well as light, heat, magnetism and electricity to be etherial undulations, for the sake of uniformity at least. What is it that excites these waves? There must be some force behind them. Is this force also motion, and the cause of itself? A cubic foot of cork contains as much ether space as a cubic foot of iron, and ought to contain an equal number of these jelly waves. It, therefore, should weigh as much as iron, if gravity be but the action of ether-waves.

The undulatory philosophy is one of ever-increasing difficulties and absurdities. The scientific darkness becomes more intense the further we advance. To attempt to deny the basic principles of Substantialism, that force of whatever character is an immaterial substance in the very necessity of things, is to run away from the light of truth—the farther one goes the worse he is lost.

You are doing a good work in exposing the fallacy of the motion-theories of current science, and future students of natural philosophy will remember your labors with gratitude. Nothing but Substantialism can save the scientific world from the intellectual gloom which up to the present decade has overshadowed it. Let the *Microcosm* have free course among our educators and our colleges,

and I predict that the candid and independent thinkers among them will not long hesitate to avow their convictions that the motion-theories of present science have seen their day, and that the only true philosophy is that of Substantialism.

Vossburg, Miss.

PRIZE ESSAY No. 3.

Substantialism.

BY J. F. LUKENS.

I don't know that I should say I run in this race for the prize; "they that run in a race run all; but one receives the prize;" and I, a plain blunt man, could not expect successfully to compete with the numerous D. D.'s and LL. D.'s that will likely be on the tapis. I write for the benefit it will be to myself and possibly that I may suggest some ideas to others.

In this case it will not be legitimate to quote or steal any of Wilford's thunder that he has been bottling up for these many years; but to state what we may chance to know or think we know on this subject, derived from other sources.

I believe the author avers that his object in espousing substantiality, was to vindicate the substantialism of the soul in contradistinction to the pseudo philosophy of Agnosticism and Materialism. Hence any thing that corroborates the claim of entity to the soul or the dual existence of the human, will be relevant to the case. Were that all the object had in view, I might right here leap the dark chasm and come to the conclusion in a nut-shell. Paul says, "There is a natural body and there is a spiritual body,"—not will be or may be, but *is*, in the present tense—there *could not be a body of nothing*, that is a manifest absurdity.

There is a something attendant on every human being, taking cognizance and record of his actions; what he does to improve and make something of self; how he uses his talents or faculties; from the day of his birth to the day of his death, which constitutes and holds the book of life of that individual alone; what that something is, though seen darkly by the masses, was seen and answered unequivocally by the Apostle, when he said "there is a spiritual body."

A prevalent belief among the masses, and some good authority, too, is that memory consists of indelible impressions made in, on or among the brain cells. Upham says, "It is a matter of knowledge that some change takes place in the organ of sensation in connection with the brain, but further than this we are involved in uncertainty." Also mentions "opening the cells of memory." And,

"Lulled in the countless chambers of the brain,  
Our thoughts are linked by many a hidden chain,  
Awake but one and lo, what myriads rise,  
Each stamps its image as the other flies."

And immediately a symposium of Philosophers, Tray Blanche and Sweetheart join in the chase, without taking a sober second thought. The brain holding indelible impressions, impressions stamped thereon of every thing that occurs in a life of sixty to a hundred years! It is preposterous and absurd, that the delicate soft brain, which at every

pulsation is being flooded with highly electrified arterial blood, and at the next pulsation a reverse flow of the same blood, bereft of its life principle, but loaded with effete and carboniferous matter to be gotten out of the system, and what is this effete matter?—Simply worn out brain.

Physiologists say that we cannot think a thought without consuming brain, and that every physical action represents a consumption of muscle; and that the whole physical body may be or is completely changed and substituted by new matter, in the course of seven years. If the bones, tendons and callouses of the body be all renewed in the stated time, it is not only feasible, but reasonable that the brain be renovated in much less time, especially in the case of persons who use their brains (which are comparatively few); but something behind the brain takes cognizance of the impressions; that something is stated by the Apostle, heretofore quoted.

I have been a little specific on this point to show that the brain is not and could not be the receptacle and record of things that are remembered for any considerable time; but is only the medium through which impressions are conveyed to and from the incorporeal, dual or Spiritual body.

Chemistry says, Light, Caloric, Electricity and Galvanism are imponderable agents; that they are efficient and powerful agents perhaps no one doubts—if *agents to do something they must be something*—the old style "Rule of Three" will tell us no cause no effect. To the foregoing should have been added Sound, Order and Attraction.

That Electricity is a substance no scientist denies, or if so I never heard of him, yet no one can weigh it or see it when undisturbed; but must judge it by its effects when its equilibrium is disturbed; in which case, if it have a suitable track to travel, it will fly to the opposite side of the globe in a fraction of a second to restore its balance. And if it have a bad road to travel, it rips and tears up things in the quickest and most fearful manner of any agent known to mankind.

Heat is, perhaps, the next most horrible and powerful decomposing agent; philosophers call it an agent; if an agent, it must be a substance.

Light is also one of the imponderable agents, and beats electricity in the speed of its flight. Is more mild and feminine in its operations than its other co-workers, is one of the indispensables in the economy of nature; for about all vegetable and animal life depend, to a more or less extent, on its benign influence and effects—must be a substance if it have any effects.

Odor, I need not take space or time to, as its substantialism is not denied.

Sound, the much mooted question, belongs to the same category of things adapted to special sensibilities, sound being adapted to the special sense of hearing, differs from light, caloric, etc., the same as hearing differs from the other sensibilities. If sound were not a substance it would be an anomaly in nature; though according to the Undulationists, Light, Caloric and Sound are nothings, but some peculiar mode-of-motion, or shuffling, advancing and retreating of something else that they can see or feel, or some imaginable fine something mixed with the air, having no tan-



gible existence, but manufactured specifically by the imagination to answer a specific purpose in a necessitous case.

The tick of a watch can be heard through a long stick of timber of many tons weight. The wave theory says the whole is put to "advancing and retreating" in waves having crest, sinus and amplitude with force adequate to put the air at the other end into similar waves, producing condensations and rarefactions sufficient to raise the temperature and increase the speed sixteen per cent., and be potent to put tons of tympanums all in a similar and consonant vibration—like water waves—for the waving must be similar in all the mediums through which the sound passes. It beats the Keely motor; after all Keely may have some kind of a natural or artificial friction screeching bug in his "sensitized" cylinder which does the mighty works claimed. It would be a slander on children to call this childish; they are born with better judgment; it is the machinations of the adult brain, stultified with learned ignorance.

West Mansfield, O.

### A GREAT DISCOVERY WANTED.

BY THE EDITOR.

One of the most important and valuable discoveries of this or any other age, and one which seems every way feasible, is a chemical process by which bodies, vegetable or animal, can be petrified or turned into stone before they shall have time to decay or change their natural appearance, thus preserving the form and features even of deceased friends, perfect for all time, as when last seen alive.

That this is within the possibilities of chemical science is plainly evident from the fact that by at present unknown processes and agencies bodies of human beings after burial do actually petrify and become solid rock under certain occult chemical conditions.

It is also a well-known fact, often confirmed by observation, that small animals, as well as various forms of vegetable production, are found petrified—changed to absolute stone—and by no doubt a very simple combination of gases or denser fluids, could the chemist only know how to prosecute these proper stages of combination in his laboratory.

Take, for example, the bushel or more of hickory-nuts recently found in a cave near Lexington, Ill., beautifully changed into stone, and every corrugation of the nuts perfect; or take the still more wonderful conversion of whole forests of standing trees into rock, and their primeval resin into crystal, as seen in Colorado and Arizona.

We came across an old petrified forest in South Park, near Pike's Peak, some twenty-seven years ago, when Denver was a paper city, with only one adobe hovel and a haystack as its sum total. This forest consisted of enormous pine stumps, some eight to ten feet high, with the remnants of the trees as they had broken off and fallen, stretched out upon the prairie in broken slabs, blocks, and irregular fragments of solid stone, indicating the height of some of those trees when standing to be not less than 300 feet.

We camped a day in this gorgonian grove, to take observations of the magnificent ex-

hibition of its wonders, and to try to discover, if possible, Nature's unknown art of embalming by conversion into stone.

Some of these trees were carefully measured, and found to be 33 feet in circumference at a height of six or eight feet above the ground; and by counting the exogenous or yearly growths of the wood, it was ascertained that one of these trees had been more than eleven hundred years old when it ceased growing.

In conversation recently with Gen. John C. Fremont on the subject of this mighty forest, he expressed his regret that he had not gone out of his way to visit that wonder when he first crossed the Rocky Mountains to California, as the Indians had advised him to do.

How these trees were changed into stone in this dry and open prairie, and by what chemical process the petrification took place, are the great problems which it is the duty as well as the glory of some original genius and chemical investigator to solve. Where is the distinguished chemist, Dr. Henry A. Mott? Our thoughts turn instinctively to him as possibly the coming man of renown who is destined to play the part of a male Gorgon (not in the sense of terrific ugliness, for he is altogether too handsome a man for that) to turn everything he looks upon into solid stone? Here is the opportunity of a hundred lifetimes, and one entirely within the range of the possibilities.

### The Real, or Substantial, in the Forces of Nature and in the Spiritual World.

BY J. W. LOWBER, PH. D., LL. D.

#### Number 1.

The following articles are a condensation of a chapter in the author's new book—"The Struggles and Triumphs of the Truth."

We have always believed that a true philosophy is in perfect harmony with the Bible. It is a relic of heathenism to claim that a thing can be theologically true and philosophically false. A true philosophy can in no sense conflict with a pure religion. There has been so much skepticism connected with the different theories of the past, that religious people are inclined to reject every system of philosophy. There have been in the past true philosophers that occupied the golden mean between extremes, and I think that such also live at the present time. There is, however, a tendency to deny the reality of everything except matter, and to make the spiritual world simply a myth. Christian philosophers have long maintained that there is spiritual substance as well as material substance. Dr. McCosh, in "The Divine Government," makes a distinction between material and immaterial substance. The expression, *Spiritual Substance*, is found on page 335. Dr. Hall, of New York, is, however, the first to emphasize the fact that there is something substantial in the forces of nature. I agree with Dr. O. A. Burgess, Pres. Garfield, and many others, that there is much truth in the position of Dr. Hall. I like Huxley's *Physiology*, and believe nearly everything he says; but I still believe that man has a spirit as well as a body. So I believe that Prof. Tyndall's experiments in the main are correct; but, notwithstanding that fact, I am satisfied that the forces of nature are something more than simply wave

motion. I will try to make this plain in the present series of articles.

Some insist that Dr. Hall has simply revived the old Newtonian theory of light. In that they are mistaken, for I spent a week with Dr. Hall, and I know that his position differs entirely from that of Newton. In the seventeenth century so much had been learned about the behavior of light, that philosophers began to inquire about the nature of light itself. The question, What is light? is not as easily answered as some might suppose. Although it is by the means of light that we see everything, light itself is invisible. The sunbeam, which you think you see shining through a crack in the window-shutter, is only particles of dust, so acted on by light that they shine, and thus become visible. We look to the shining of the moon which is only reflected from the sun. Although the light must exist at the place where we see the moon, it is invisible, unless reflected by the little satellite. Newton believed light to be invisible particles of matter. He tried to calculate how small these particles could be and not injure the eye.

Christian Huygens, a Dutch astronomer, suggested the wave theory of light; and Newton, who believed in the same theory of sound, could not well reject it. As Huygens insisted that light is a vibration, it is evident that there must be something between us and the sun to vibrate. To meet this difficulty, he had to suppose space filled with a jelly-like substance, called luminiferous ether. He had to suppose that substance sufficiently fine to pass between the atoms of even solid bodies, and that the sun and other luminous bodies caused it to vibrate, so that its undulations strike upon our eyes, and give rise to the sensation of sight. This theory has entirely too many suppositions, and it fails to account for all the phenomena of light. This jelly-like material substance, striking upon the eyes, would be as likely to put them out as would the material particles of Newton's emission theory. This luminiferous ether has been shown in "Christian Thought," to be one of the fictions of science.

Forth Worth, Texas.

#### The Magnet in Substantialism.

BY THE ASSOCIATE EDITOR.

There is no single piece of scientific apparatus known to philosophical investigators so important for the demonstration of the truth of Substantialism, as relates to a possible immortality for man, as the common steel magnet. Its conclusiveness in favor of the central proposition of the Substantial Philosophy—that the forces of nature are objective entities, at the same time immaterial substances in opposition to the mode-of-motion theories of the schools—is so overwhelming that to deny it is to expose one's total incapability of reasoning logically on any philosophical subject. Indeed, so self evident is the proof of Substantialism derived from the action of magnetic force upon a ponderable mass of iron at a distance, that the most untrained person has only to be shown the proper use of a magnet for a single half-hour to become an intelligent convert to that philosophy. Many witnesses can attest to this fact. I have shown the effects of the magnet, in lifting bits of iron, to persons who

had not the slightest conception of such possible entity as an "immaterial substance," and at once have opened their minds to a new world of substantial existences.

There is scarcely an intelligent person who has not seen or at least heard of a common horse-shoe magnet, though there are very few who had formed a true conception of its vast significance in the realm of scientific research previous to the publication of the "Problem of Human Life." The conceptions of the most profound physicists previous to that event, concerning the true nature of magnetism as a dynamic agent, were either extremely vague or wholly erroneous.

Take even as profound and learned a savant as Sir William Thomson, as an illustration of that entire class of physical investigators, and his attempted explanation of magnetism, in his great address before the students of the Midland Institute at Birmingham, England, a few years ago, must strike the mind of an intelligent believer in Substantialism as not only pitiable but puerile in the extreme. That greatest of modern thinkers proved himself to be so utterly in the mode-of-motion fog of current scholasticism that he deliberately told those students that "magnetism is nothing more nor less than the rotary motion of the particles of the steel magnet." Yet not only those students, but the whole scientific world; barring Substantialists, accepted the absurdity as authoritative scientific truth.

The fact is, Sir William Thomson was a consistent motionist in the extreme sense of that term. He not only believed in the wave-theory of sound, in the undulatory theory of light and in heat as a mode of motion, but he had enough native and intrinsic congruity in his solid Scotch make-up to see that if all these motion-theories were true; it would be but the climax of inconsistency to regard magnetism and electricity as anything but corresponding modes of motion of some sort of material particles.

He saw, as every sound logician should see, that as magnetism did not stir the intervening air, and as it did not move the mass of iron it lifted, except bodily, it must therefore be the rotation of the particles of the steel magnet. His common sense told him that no sort of material threads could extend away from the magnet to seize the piece of iron and lift it bodily, since a sheet of glass placed between the magnet and the piece of iron would have not the slightest effect in cutting off the lifting power of the magnetism. But of course he had formed no conception of such a department of entitative existence as *immaterial substance*. This single fact was a total bar to his comprehending the subject.

Such an idea as that any substance in nature could be immaterial, would have been pronounced by him as paradoxical in the extreme, if not an absolute self-contradiction. To such cultured and consistent scientific intellects there is no substance in the universe except matter, and no force in the universe except the motion of material particles. Hence the force of magnetism which lifts a mass of iron, not being matter, since it acts through the densest of material bodies as if nothing were present, can be nothing except the other alternative—motion; and since it must be motion and nothing else, to maintain the slightest harmony with sound, heat and light, that rep-

representative physicist of the University of Edinburgh, and President of the Royal Society of Great Britain, gravely assured the two hundred students of the Midland Institute and the assembled scientific wisdom of the city of Birmingham, that "magnetism is nothing more nor less than the rotary motion of the particles of the steel magnet."

Seriously, we ask, can it be possible that such an educated intellect—so crammed with classic lore, scientific scholasticism, physical and metaphysical research and mechanical experimentation, in which in every conceivable instance there must have seemed to exist a practical and cogent relation between cause and effect—can it be possible, I ask, that such a representative physicist could have been satisfied to leave that assemblage of students and scientists with such a sham, stupid and monstrously absurd explanation of magnetism as the one he gave them?

Place a handful of common tacks on a glass or porcelain plate, and then pass the poles of a magnet below the plate, moving it criss-cross and in circles, and watch the tacks darting hither and thither, following the minutest movements of the magnet! What conceivable idea can the rational mind form, when disenthralled of the theoretic shackles of modern scholasticism, save that an immaterial substance radiates from those magnetic poles, passes unimpeded through the glass, fastens itself to the same potential substance in the tacks, and thus holds and manipulates them according to a fixed law of nature? What intellect, possessing the least originality, could for one moment conceive it possible that the rotary motion of the steel particles of the magnet among themselves, even if such rotary motion were a fact, could have any effect whatever on the distant tacks? Yet the amazing fact stares us in the face, that the foremost physicist of the age, was forced into that very monstrosity of philosophical thinking alone because he had not heard of the Substantial Philosophy, or because some kind friend had not called his attention to the "Problem of Human Life." What a pity that the great Sir William, previous to that unfortunate episode, had not in his travels stumbled upon a stray copy of that "funny book," as Prof. Tyndall called it, and have saved himself and his posterity the humiliation of that futile as well as fatal definition of magnetism—the "rotary motion of the steel particles of the magnet."

Prof. Tait, professor of physics in the University of Edinburgh, and the rising compeer of Sir William Thomson, but vastly less consistent, came out squarely in favor of heat as an objective entity, at about the same time that Sir William displayed his remarkable scientific acumen before the Midland students at Birmingham. Yet that eminent professor of physics, while giving a crushing backset to the theory of heat as a mode of motion, in direct conflict with the science taught in all the colleges, lacked the scientific intuition and consistency to grasp the other forms of natural energy or phenomena-producing causes and wheel them into the same category with heat as substantial entities.

It seems amazing that a man who was capable of breaking away from heat as a mode of motion could be so seriously lacking in originality as not to include light, sound,

magnetism, electricity, gravitation and any other form of natural force which is known to be the cause of any observed effect. But such was the fact, and such is also the startling fact with a majority of our great professors of physics in the colleges and universities of this country. Unlike Prof. Tait, however, they believe everything to be *motion* that is not *matter*. He did make one exception in heat as an objective existence, though whether he regarded heat as finely attenuated matter or highly concentrated motion, he did not tell us because, perhaps, he had even yet formed no real intelligent conception of the existence of immaterial substance.

But not so with the great mass of the physical professors of our colleges. With them *matter* and *motion* constitute the entire universe—immaterial substance being to them incomprehensible. Hence, the inevitable tendency of our present average college system of education toward materialism and infidelity. Although many of these professors are Christian men and able theologians, they never think that their vague and unsatisfactory motion-theories of science lead directly and logically to the atheistic doctrine of *soul* as a mode of motion of the material particles of the brain, just as sound is but the motion of the material particles of the air. They seem incapable of profiting from the lesson given them by Prof. Haeckel in his "History of Creation," that the only logical conclusion deducible from the teaching of the colleges concerning the physical forces as modes of motion, is, that the life, soul and mental phenomena are but corresponding modes of motion of organic matter, and consequently that there is no God except the normal motions of matter under the natural laws and forces.

As the motion-theories of the natural forces are still taught and insisted upon by our Christian professors, we reluctantly charge that they are unconsciously aiding and abetting materialism of the worst kind, and thus unwittingly strengthening the hands of German and English atheists in their denial of the existence of the soul as an entity or anything capable of salvation; and that they are actually helping these enemies of the church to prove that *death ends all*. For plainly, if force of any kind is but the motion of matter, then all force must be motion and nothing else, as the only logical inference from present science. It follows inevitably, if these motion-theories of force be true, that when the brain-particles cease to vibrate (as both the *effect* and cause of vital, psychical and mental force), and when this material organism shall become quiescent in death, then must these modes of motion absolutely cease to exist, just as sound-force, being simple motion, ceases to exist whenever the air-particles cease to vibrate. Such is the only logical deduction from modern science.

From all this reasoning we can plainly see the necessity of Substantialism in its revolutionary crusade against current science, flashing out as it does its assuring rays of hope like a calcium light shining in a dark place.

At the advent of the Substantial Philosophy ten years ago, it found the religious world unconsciously but rapidly drifting toward materialistic skepticism by this same persistent inculcation of the motion-theories of the natural forces. The greatest religious philosophers of



both continents at that time, stood utterly bewildered and helpless before the arguments of Prof. Haeckel on the motion-theory of the soul as invincibly deduced from the science of the schools. Witness the predicament of the distinguished Joseph Cook, as pointed out in the "Problem of Human Life," at page 71.

But that eminent lecturer and Christian philosopher, thanks to the light of Substantialism, now sees things very differently, and would be more than a match for a score of such materialists as Professors Haeckel and Huxley. In one of his recent lectures he boldly declared that "No logical thinker can be an atheist or materialist who will carefully study the steel magnet,—that within its mysterious operations, when properly analyzed, are to be found the hidden scientific evidences of the existence of God and of the clear possibilities of a future life for man."

So say all substantialists. It was, in fact, the operations of this same little magnet which as a God-given key first unlocked to the founder of Substantialism the logical door which led to the great storehouse of scientific evidence by which he was enabled to repudiate and annihilate every motion-theory of force as taught in the text-books, and it is that same unmistakable revelation from God's book of nature which in the hands of conscientious experimentors will drive away all lurking doubts of the existence of the substantial soul of man while dispelling every reasonable fear concerning a hereafter for humanity.

#### The Explosion of Meteors—A Mystery.

BY THE EDITOR.

There is scarcely a problem known to science which presents such insuperable difficulties to a rational and satisfactory solution as that of the true cause of meteoric explosions; and this question is now producing considerable agitation among scientific investigators. It is not a mere opinion that is wanted as to the cause of this strange phenomenon, but a system of known facts in science and especially in mechanics, with logical deductions therefrom, which may form a probable and reasonable basis for explaining the cause of such explosions.

We have had the rare pleasure of witnessing one such heavenly wonder. A meteor of the apparent size of our moon, though, of course, much exaggerated on account of its brilliancy, passed at an elevation of about twenty degrees horizontally from west to east along the northern horizon, when suddenly in the north-east it burst into myriad scintillating fragments, somewhat as a large skyrocket explodes, each fragment or spark going out and apparently dissipating itself within a short distance from the center of explosion, leaving a lightish, smoky cloud surrounding the spot, as also a faint trace of the same color for a minute or so in its trail.

About half a minute after the explosion occurred a loud report, as of the sound of a cannon, was heard, showing the meteor to have been about six or seven miles away; while just previous to the report a roaring sound was heard from the train of the meteor resembling somewhat the passage of a distant train of cars.

We have frequently been requested by correspondents to give in the *Microcosm* some sort of solution to this problem; but we confess that up to the present time no satisfactory explanation has occurred to our mind.

We have received from one of our contributors a very ingenious and critical paper suggesting a solution of the mystery, but so manifestly defective in some respects that we advised the writer to withhold it and try again. We now ask our scientific readers to think of this problem, and try if some satisfactory conclusion cannot be arrived at.

Dr. Richard F. Stevens, of Syracuse, N. Y., has for some time been engaged in correspondence with scientific institutions in different parts of the country for the collection of all the known facts and conclusions on the subject with a view of giving an epitome of such data, even should they not amount to a satisfactory solution. Let each reader who may fancy he has an original idea on the subject study it well and then report it very briefly to the *Microcosm*.

We will only add that our own mind has been busily at work at odd times, even for months past, in trying to master this enigma of physical philosophy, and although we have as yet reached no positive solution of the problem, we begin to see one in the distance as through a glass darkly. When all the facts and suggestions within reach shall have been collected, if the mystery is not satisfactorily explained, we may try what can be done.

#### Can Life-Force and Mind-Force Exist Separate from Matter?

DR. WILFORD HALL.

Dear Sir: I recently met a thinker who came at me in this way: "We acknowledge that matter and force are indestructible, as taught by philosophy. Force can neither be increased nor decreased in quantity, but it can be concentrated and transmitted; and the transmission of it is what we mean by the forces of Nature made subservient by or to the will of man."

This has but little bearing on the question of immortality, although from a strictly scientific view such investigations are of great value. When these special or individual forces come to manifest themselves, they are absorbed into a general or universal fountain of force which takes in all smaller forces, and which is but a restatement of the old proposition that the one contains the many.

Following up this line of thought, then, and the universal mind is the enduring mind, as it swallows up all individual minds. And so, also, with life-force. The result is the absorbing of the individual total (humanity), and the existence only of the general (God), which never dies.

I am not able to give a clear or satisfactory answer to this, though I believe I have read what would seem to explain it somewhere in your writings, but have not seen it lately. If you have time, I would like very much to have you give a short explanation of the difficulty. I am making Substantialism something of a study, and I hope ere long to master it.

Yours very truly,

Lincoln, Neb.

G. C. SMALL

## REMARKS BY THE EDITOR.

There seems to be no difficulty in comprehending the simple principle of philosophy that the specialized forms of force called Mind, Life, Soul and Spirit, after their schooling isolation in the "human form divine," may retain their individual forms in the shape of conscious entities and organized personalities; and though these forms of force may return, when separated from material structures, to the great fountain of all intelligent force, they may and no doubt will still be permitted to retain their conscious and personal individuality.

We see no reason why the mind-force and life-force of human beings should not retain their individual and personal character when admitted into the realm of the universal mind-force and life-force now constituting the intelligent force-fountain called God, any more than why this universal force-fountain itself should be incapable of conscious, intelligent action.

If God, as the aggregate fountain of all conscious intelligence, can be conceived of as capable of exercising vital and mental powers in the creation of the universe, it is straining a logical point to say that vital and mental organisms, manifestly made in the image of God, should not be permitted to retain a god-like personal and conscious individuality after leaving their material existence.

Although magnetism, gravity, heat, electricity, and other forms of unconscious force do actually fall back after use into the general force-element, there to be conserved as integral portions of the same, it in no manner conflicts with rationality to suppose that such forms of force as light, heat, sound, etc., might retain their individual identity or characteristics for a time after returning to the force-element, should there be any special use in such retention. That there is a special use and even necessity for the life-force and mind-force of humanity retaining its individual personality after it leaves the material body it has inhabited here, and so on to eternity, would seem every way consistent with the nature of such rational, self-conscious and god-like personality. No other view can be taken unless we deny the conscious and individual existence of a similar but infinite intelligence in the being of God himself. If God, as an intelligent Creator, can exist without a material body, it is but the hardihood of philosophical bigotry to deny the rational probability of the continued individual existence, under similar immaterial conditions and environments, of a personality possessing a nature precisely similar to that which must go to make up the intelligent being of God.

It is the glory of Substantialism that it can show rational, consistent and scientific grounds for the present existence and the after conservation of the natural forces as substantial entities instead of leaving them, according to present science, nonentitative modes of motion, and in this manner to frame a rational, analogical basis for the personal conservation of the vital and mental forces of the higher organized intelligences of the universe.

If God, as the universal force of vitality and mentality, as just intimated, may exist as a conscious personal entity capable of designing and creating the world and the things therein, which few good thinkers now doubt, then

surely it requires no undue stretch of credulity to believe that human intelligences entirely godlike in their nature and activity, only on a finite plane, may and actually will exist, when unclothed of mortality, with as true a personal and conscious individuality as does God himself. On this analogical battlefield Substantialism has pitched its tent and unlimbered its artillery for the final campaign with materialism; and we do not believe it is at all doubtful as to which side will belong the victory in the near future.

## "The Age of Aluminum."

Our editorial, month before last, with the above heading, has been received very flatteringly by the press and by the masses of our readers, many of whom volunteer the statement that this article alone is worth more than the subscription price of the paper. The *Octographic Review*, an ably conducted journal of Cincinnati, Ohio, of the same church organization as the *Christian Standard* and *Apostolic Guide*, which we were forced to criticize somewhat severely, prints the entire article on "Aluminum," and generously adds:

"The foregoing we clip from the *Microcosm*, a monthly of sixteen pages, by A. Wilford Hall, of New York. \* \* \* We wish him success, and say to those of our readers who may be interested in scientific investigations and discoveries, that A. Wilford Hall is decidedly the most masterly and likewise the most entertaining scientific writer after whom we have ever read. The price of the *Microcosm* is only fifty cents a year. Send orders to A. Wilford Hall, 23 Park Row, N. Y."

Eld. Daniel Sommer, the proprietor of the *Review* and writer of the above, sends us a highly complimentary letter in regard to the value of Substantialism as an auxiliary to Bible Christianity. He says:

"Allow me to assure you and your readers that the reception with which Substantialism has met in those two journals [*Standard* and *Guide*] should not be regarded as a criterion by which to measure the intelligence of the Disciples as a people. \* \* \* The Pharisees of old wished first of all to know if any of the 'chief rulers' had believed on the Nazarene before accepting his mission. So these journals are watching the so-called 'greatest minds the world has ever seen' and measuring the popular current. But I am glad to say that among the readers of the *Octographic Review* are many admirers of the Substantial Philosophy. Only a few minutes ago a preacher of over twenty years' active work informed me that he had saved a church from the influence of Materialism by the aid of the first volume of the *Microcosm*, though said church had been seriously damaged. Let me assure you that those who read the *Review* and several others of our journals which breathe a similar spirit, have sufficient individuality to investigate and courage enough to accept truth even though it be unpopular."

Thanks, noble friend, thanks! And here we will add in a word, that Bro. Sommer thinks, and we have no doubt justly, that we were too severe and sweeping in our remarks concerning those two papers and their chronic opposition to Substantialism. He thinks we ought to apologize, since many good friends of the

cause we plead are, as he believes, justly defended at our somewhat latitudinous denunciation. We candidly admit the force of this rebuke, since we have had time to cool off, and we hereby apologize as requested. We need every friend of Substantialism to stand by this work, and if the managements of those two papers will persist in their causeless opposition, let them alone be responsible. We therefore frankly take back all we have intimated against the rank and file of that brotherhood outside of the adherents and abettors of those personal enemies of Substantialism and its founder.

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**A Short Specimen Lecture on the Substantial Philosophy.**

BY REV. JOHN CRAWFORD, D. D., F. S. SC.

God has given to man two revelations—one in nature, and the other in the volume of inspiration. Between them there is no conflict, for they have come from one and the same source,—the God of truth; nor is any thumb-screw exegesis required to harmonize them. It is false science or false theology only which requires such violent methods of interpretation.

In every age, and in none more than the present, has false science attempted to force the language of scripture.

I might point to much of the science taught in our colleges and text-books, which is contrary alike to true science and the word of inspiration. Among others, I might point to Darwinian evolution, that monstrous burlesque on science and outrage on common sense! On another occasion I hope to take up this subject, as I have done in the past; but to-night my subject is the Substantial Philosophy, and to this I must confine myself.

Perhaps some may ask, What is the Substantial Philosophy? It is less than a dozen years ago when it first saw the light in the most remarkable work of the present age, the "Problem of Human Life," by Dr. A. Wilford Hall, one of our best thinkers, and one who is doing more than any other man to purge science from its time-honored errors.

We must bear in mind that the common teaching of the schools and text-books is that the forces of nature, such as heat, light, electricity, magnetism, gravity, sound, etc., are nonentities, mere modes of motion, only the result of the movements of material molecules.

Such atheistic scientists as Haeckel go a step further in the same direction. He says: if these forces of nature are no more than modes of motion, there is no scientific proof that the soul of man is more than the result of brain motion, and, when its throbbings cease in death, the soul also ceases; nor have we evidence that God is any more than the working of nature's laws. Now this skepticism is the legitimate result of the materialistic teaching of the schools, which regards nothing as substance but that which is material. The Substantial Philosophy, on the contrary, teaches that there are two classes of substance, the material and the immaterial; and that the latter is as *real* as the former, and vastly the more important.

Here is a magnet. It is a material substance. So is its armature, this piece of soft iron. You can see them and handle them. They have weight, and they can not occupy at

one time the same space as any other material substance. We say, in popular language, that the magnet draws the iron; but this is not scientifically true. There is a third substance present, which we call magnetism. This draws the iron, and this is as real as either the magnet or the armature. The only difference is, that while they are *material* substances, it is *immaterial*, but as really substantial as they are.

The common teaching is, that the motion of the molecules of the magnet draws the distant iron. This is but a learned way of concealing ignorance. What evidence have we that the molecules of the magnet move? And suppose they do, how could this internal motion draw the distant iron?

Suppose we have a mill full of machinery, all in motion, how could this motion draw the house standing on the opposite side of the street? But, set up a capstan in the mill, to be moved by its machinery. To this attach a rope or chain, and fasten it to the house opposite. As the rope is shortened the house moves to the mill. Now, is it not this intervening rope which connects the two? So it is the intervening substantial magnetic force that draws the iron.

I ask again, is this intervening magnetism nothing? Is it not as real as the magnet itself? It is immaterial substance, I admit, but a real entity. Motion, on the contrary, is nothing but change of position in space, as the founder of Substantialism was the first to explain.

The same line of reasoning will apply to gravity. All material bodies, we say, attract one another. The sun attracts the earth. A stone falls to the earth because, as we say, it is attracted by the earth. Now, I have no objection to this popular phraseology; but it is not, nor is it intended to be, philosophically correct. The sun, at a distance, can not act upon the earth by any action of its internal molecules. It is the intervening gravital force that does the work.

Sir Isaac Newton got a glimpse of this truth, but never applied it, and finally lost sight of it. When writing to Dr. Bentley he says: "That gravity should be innate, inherent and essential to matter, so that one body may act on another at a distance through a vacuum, without the mediation of anything else by and through which their action and force may be conveyed from one to the other, is to me so great an absurdity that I believe no man who has, in philosophical matters, a competent faculty of thinking can ever fall into it." Newton is certainly correct. There must be some intervening substance to act, like the rope in the case of the moving house.

It appears evident that there must be a constant current of gravital force flowing toward every material object, and this current is proportionate in its strength to the quantity and quality of the material object toward which it flows, which current carries with it any other material body which comes within the range of that current. Moreover, as this gravital current converges toward the center of the material body to which it flows, its strength increases according to the inverse squares of the distance. Moreover, as it reaches its object, and having thus fulfilled its mission, it is either relegated back to the universal fountain of force, from which it came, or is transformed



into some other manifestation of force. It is altogether likely that the gravital current, after reaching the sun, is changed into light and heat, to be radiated through the solar system for its heating and illumination. The steady current of gravital force to the sun never adds a particle to its weight or bulk; nor does the constant radiation of light and heat from that body ever diminish its material substance, simply because light, heat and gravity are immaterial, not material, substances.

Let us next consider heat as another form of energy from the force-element of nature. The common teaching is that heat like sound is mere motion of material ether. It has no weight, I admit, as no immaterial substance has, and because it is not matter. Being immaterial it can occupy the same space as the material substance which it warms. Here is a fire of coals. Now, I ask, is it the inherent motion of the molecules of the coals which constitutes the heat? or is it the heat which dissipates the particles of the coals and radiates through the room to warm the air? Most certainly the latter. Heat, then, is not motion of any kind, but is something which moves and causes motion.

I might show that electricity is also an immaterial *entity*. The electricity from the cloud strikes and shatters the strong oak. Is this nothing but motion? Motion of what? Motion of itself? Then itself must be something, hence a real immaterial substance.

But time will not admit of my going, however briefly, through all forms of the force-element of nature. I must confine myself, at present, to two others, light and sound.

In our text-books light is said to be nothing but the undulation of a very subtle material substance termed *ether*, which pervades all space, as well as all opaque, transparent and translucent bodies, such as coal, glass and diamond, and whose undulations cause the sensation of sight.

To this permit me to say that there is not a particle of evidence for the existence of this subtle *ether*! It is a mere creature of the imagination. Its existence, even if admitted as an hypothesis, explains nothing! Light, like all the other forms of the force-element, is a real immaterial substance, radiating from its source and passing through a vacuum as easily, and indeed more easily, than through any transparent material substance. In this respect it resembles magnetism somewhat, though it differs from both electricity and sound, which require a conducting medium.

Here I may be asked, Did not Sir Isaac Newton, at one time, hold this emission or substantial theory of light, but ultimately abandoned it? It is true that Newton held a substantial or emission theory; but it had one radical defect, from which the Substantial Philosophy is entirely free. He regarded light as a *material* substance, although of an exceedingly subtle nature. And this theory he was forced to abandon, from the consideration that matter, however subtle, traveling at the enormous rate of 180,000 miles a second, must certainly destroy any eye into which it enters. This is true, if light be a *material* substance; but the objection has no force whatever, if light be, as the Substantial Philosophy teaches, an *immaterial* substance. Had Newton looked upon this question in the light of Substantialism, he never would have abandoned the

emission or substantial theory, nor would he have tolerated, for a single moment, the existence of this imaginary *ether*.

Light is not a simple substance, but can be divided, by a prism, into seven distinct colors. Now, if the common teaching be correct, light is a nonentity, and yet it can be divided into seven parts. Each of these colors is, therefore, the seventh part of nothing! Is this science? or is it "science falsely so-called?"

But we must pass on to the consideration of sound. Here is where the battle between Substantialism and the current teaching of the schools must be fought. And, on this battleground, Dr. Hall has already cleared the field, and spiked every gun of his opponents, or turned their fire against their own ranks.

This, however, is too extensive a subject to be gone into fully at present. According to the text-books, sound is but the waving of atmospheric air, its waves striking the tympanum and causing the sensation of sound; whereas Substantialism regards sound as a real immaterial substance—a form of natural force from its universal fountain called forth by the vibration of any sonorous material substance; and, when thus generated or liberated, it is radiated or conducted through any suitable medium to the tympanum, causing the sensation of sound.

Put to your ear the end of a rod of iron, say a mile long, so as to exclude all atmospheric air, and let a friend strike or file the farther end. The sound is distinctly heard. Is this sound caused by the waving of atmospheric air? or is the sound *conducted* to the ear through the iron rod itself? Clearly the latter. Again, place one ear in the water of a lake or pond, with the finger tightly placed on the other, to exclude the air. Let two stones be then struck together near the surface of the water. You hear the sound distinctly. Was this sound the waving of atmospheric air? or was the sound force *conducted* through the water to the ear? Some may say it was the waving of the water. But water is a denser substance than the elastic air, and its wave motion, if this really takes place, must be slower. How then does sound travel four times faster in water than in atmospheric air? And what shall we say of the iron? Does it also wave? If so, how does sound travel through it seventeen times faster than through the atmosphere? It is obvious that air, and water and iron are but the *conductors* of sound. The density of any substance is no impediment to the passage of sound, because sound, being an immaterial substance, can, like electricity, occupy the same space as its conductor.

Dr. Hall has astonished, and completely puzzled, the advocates of the wave-theory by exhibiting a locust, whose sound can be heard a mile off. This little creature, by the almost imperceptible tremor of its body, must, according to the wave-theory, churn four cubic miles of atmospheric air, so as to raise its temperature and augment its elasticity sufficient to add one-sixth, or 174 feet a second, to the velocity of its sound.

But let us briefly examine some of the strongest arguments advanced by the advocates of the wave-theory. Suspend a musical box, say they, in the receiver of an air-pump. So long as the air remains in the receiver we hear the music; but exhaust the receiver, and

the music ceases. There is no sound, they say, because there is no air of which to form waves. Substantialism, on the contrary, says there is no sound heard because there is no air to act as a conductor; but let the musical instrument be lowered, until it rests on the bottom, and the music is heard, although there is no air in the receiver. In this case the bottom acts as a conductor.

Again, in the case of a gunpowder explosion, the sound-waves, it is said, break the windows in the vicinity. Substantialism says it is not the sound-waves, but the sudden release of a large quantity of powder gas, violently and suddenly condensing and forcing back the atmospheric air to make room for itself, that breaks the glass.

But we can not dwell any longer upon this topic. We have spoken of heat, electricity, magnetism, light, sound, &c., as among the forms of the force-element of nature. These, properly speaking, are but *different manifestations* of one and the same universal force-fountain. The form, or manifestation, which this force-element takes, being regulated by a difference in the material circumstances in which it is developed and the office it has to fill. Electricity, for example, may, by a change of physical circumstances, be converted into light and heat. Pass a strong current of electricity along a thick silver or copper wire. Cut this wire and separate the ends, say six inches, and connect them by a very thin platinum wire. When the current comes to this gap, bridged by this thin platinum wire, only a portion of the electricity can pass; or, if it all passes, it is with much greater resistance. Some of it is converted into light and heat, as the incandescence of the platinum wire proves.

If time permitted we might show that electricity, and even gravity, can be converted into magnetism, &c., &c., but time forbids.

I now come to the last, but most important, part of my lecture, to consider very briefly the spirit that is in man and beast.

The bodies of men and beasts are material organisms; but, within the material, there is another organism, which is immaterial. The soul is not, as some suppose, like a mathematical point, having position but not magnitude. The spiritual organism fills the physical in every part. The inner man also weaves its own material covering. If the outer organism be injured, the inner, living organism throws the bioplastic shuttles, by which it repairs its outer covering. In some of the lower animals this power is so great that even a lost limb is restored, as in the case of a salamander and some of the crustaceans. Remove the eye of a lizard, and a new one is fabricated by the immaterial organism that remains, which thus supplies a covering for itself, fashioning it after its own pattern.

Not only does the incorporeal, vital organism repair the material, but it even builds the latter in the womb; and, while the material ovule in the goat, sheep, dog, wolf, man, &c., are precisely alike physically, viewed under the stronger lenses, the development is entirely different, because the immaterial organism, which builds after its own pattern, is different in each and determines the specific form.

Now, when the outer covering of the soul, the physical organism, is dissolved in death, it by no means follows that the inner, vital

and spiritual organism, the intelligent and responsible soul, perishes with it. When the outer case is broken up, the precious gem within may be safely preserved; and, when the last trumpet shall sound, the body also will in some way be delivered from the bondage of corruption and refashioned by the renewed spiritual organism, which again takes possession, and will reconstruct the material after its own transformed and imperishable pattern.

The following are specimens of the questions proposed by the audience, and answered by the lecturer:

Question 1. If a tuning fork be sounded, another fork of the same pitch in the room near by will begin to sound; is not the vibration of this second fork therefore caused by the sound waves of atmospheric air, proceeding from the first?

Answer. Sound is called forth by the vibration of any sounding instrument in sympathetic accord, and has within itself a *vibrating force*. Now I maintain that it is not any wave-motion of the atmosphere, but the vibration of this form of the force-element, or sound *itself*, which causes the vibration of the second fork, if in unison with it. While we are on the subject of tuning-forks, let me say that Capt. Carter has demonstrated, in carrying out a new law discovered by Dr. Hall, that a tuning-fork will emit sound after its motion has decreased to a rate many times slower than that of the hour-hand of a clock! And how, I ask, could a motion so slow throw off such atmospheric waves as the common teaching demands?

Question 2. By your statement some of the lower animals can replace a lost limb, by the force of their vital or incorporeal organism, but which this immaterial or spiritual organism in man can not do. Does not this prove that the spiritual organism in man is inferior to that of some brutes?

Answer. I did not say that the vital and spiritual organism in man *never* restores a physical organ; for, in the case of some infants who have had supernumerary fingers amputated, these fingers have been known to grow a second time, according to facts cited by Mr. Darwin. Whole bones removed by the surgeon have also been replaced by the action of the physical bioplasts.

I do not deny, however, that, in some respects, the brute is superior to the man. In size both the elephant and the whale are his superiors; in strength he is surpassed by the lion; and, in the sense of smell, by the hound and the spaniel. It is in intellectual and moral power that the superiority of man appears; also in the volume of brain, the specific organ of these powers. The size of the human brain is more than double that of the highest ape. It is the intellectual and moral faculties in man that place him immeasurably above the highest brute, and constitute him a responsible creature, made after the image of God, and lord of this lower world.

Question 3. Granting that the forces of nature are entities, if immaterial, why call them substances?

Answer. The word substance is derived, through the French, from the Latin sub (under), and stare (to stand). It means something which *sustains* attributes or qualities. Now, all the force-elements of nature, as well as the

spirits and mental powers of men and brutes, possess attributes. The thing in which such attributes inhere must, therefore, be a substance. Matter, according to all scientists, has been held as fully comprehended in these three,—the *solid*, the *liquid*, and the *airiform*. Now, while these three are substances, they are all material. I can not, therefore, divide all existent things better than into *material* and *immaterial* substances, as originally set forth in the Substantial Philosophy.

St. Thomas, Dakota.

#### The Motion-Theory of Electricity.

[The following supposed proof of electric waves, analogous to sound-waves, has been clipped from the *New York Independent* of January 3, by the Rev. A. L. Hutchinson, a subscriber at Lansing, Iowa, and kindly sent to us for our comments in the *Microcosm*]:

[From the *New York Independent*.]

"ONE of the most interesting and important of the results of scientific observation during the past year is the establishment of the fact that waves of electric induction are propagated through air at sensibly the same rate as waves of light. The experiments which have decided this point were made by Hertz in Germany, and consisted essentially in a most ingenious determination of the length of certain electrical waves, their rate of vibration being known. When we know the dimensions of a rectangular frame of wire, say four feet by six, and the size and material of the wire of which it is made, it is possible to compute the number of electrical pulses per second that will occur in it when it is connected with one of the electrodes of an induction coil that is being rapidly charged and discharged. These electrical pulses are propagated outward from the rectangular frame in all directions through the air—or more strictly through the ether—and when they strike a reflecting surface, such as the wall of a room, they are reflected. The reflected waves interfere with the direct ones, and in consequence we find established a series of positions where the electric disturbance is a maximum and others where it is a minimum. The case is closely analogous to that of the well-known acoustic experiment, in which a tuning-fork of known pitch is made to sound before a reflecting wall, and the space between the wall and the fork is explored with a properly tuned resonator, showing alternate regions of sound and silence. (This is written without the least regard to Dr. Wilford Hall's theories or feelings, but it is the statement of a fact.) The interval between any two successive points of silence or of sound is just one wave length of the musical note emitted by the fork. If, then, we can find an electric resonator capable of performing a similar function to that fulfilled by the acoustic resonator we ought to be able to determine the length of the electric waves. Now this function is performed by a *second wire frame*, just like the first, except that there is a slight break in it, a few thousandths of an inch in width, where sparks appear whenever the frame is placed at a point where electric pulsations are occurring of the proper period. When the space between the primary frame, as we may call it, and the reflecting wall was explored with this electric resonator, equidistant nodes and maxima of electric disturbance were easily and surely detected. If we multiply the length of an electric wave thus determined by the number of waves that pass in a second, we get the velocity with which the electric disturbance is propagated, and this, as we have said, comes out sensibly the same as that of light. Hertz's experiment is the first demonstration of what has long been believed to be a fact, tho' without proof."

#### REMARKS BY THE EDITOR.

We can not be too grateful to the editor of the *Independent* that he was uninfluenced by the least regard for "Dr. Wilford Hall's theories or feelings" in giving to his readers this astounding bit of scientific information. We take pleasure in notifying the *Independent* editor that he can do nothing so gratifying to the editor of the *Microcosm* as to print every week just such "scientific observations" as the foregoing, thus furnishing us ready-made dynamite with which to explode the motion-theories of the physical forces; and if the

reader will follow us for a moment he will have the pleasure of witnessing the wave-theory of electricity follow the wave-theory of sound to utter extinction.

Observe, first, when restated in plain language, that Prof. Hertz, with a wire-frame four by six feet as an electric resonator, explores the space between a similar electric frame and the reflecting wall of a room, all for the purpose of watching sparks emitted from that resonator whenever it happens to touch a node where there is no interference between the direct waves and reflected waves which, as claimed, constitute electricity. Then, by continuing this exploration,—that is, by moving the wire-resonator about,—it will perchance strike a sector of this ether-space where the direct and reflected waves will interfere or, in other words, a half wave-length, the same as in sound, where there will be no sparks emitted, thus easily determining the true wave-lengths of electricity. By these delicate experiments, as we are assured, the "*equidistant nodes, and maxima of electric disturbance were easily and surely detected*;" and thus it was demonstrated for the first time, from the similar wave-lengths of electricity to those of light, that their velocity are the same,—"*what has long been believed to be a fact tho' without proof*."

Now we have taken the trouble to restate this "scientific observation" so that the reader can make no mistake in comprehending the *Independent* editor's disclosure which he so cruelly made "without the least regard to Dr. Wilford Hall's theories or feelings." And the statement of the discovery of Prof. Hertz, indorsed by the *Independent*, being as thus given, we will now, without the least regard to the theories or feelings of that editor, and in just two minutes and a half by the watch, publicly exhibit his scientific scalp dangling from the center-pole of our *Microcosmic* wigwam. Notice the way we do it. Prof. Tyndall, treating on the number of light-waves, and consequently their wave-lengths, says:

"All these waves enter the eye in a second. In the same interval 699,000,000,000,000 waves of violet light enter the eye. At this prodigious rate is the retina hit by the waves of light."—*Tyndall on Light*, page 66.

Next, the reader will remember that light travels, in round numbers, 180,000 miles a second. Hence, by dividing the number of waves (699,000,000,000,000) per second, by this velocity of light (180,000 miles per second) we find that there are 3,327,000,000 of these wave-lengths in a single mile; 630,000 wave-lengths in a foot, or 52,500 of these wave-lengths within the space of a single inch! (Let the reader repeat this calculation.) And as the electric wave-lengths are the same as those of light, since their equal velocity was determined by Prof. Hertz by exploring for the length of their waves, it follows that within every inch of space between this "primary frame" of wire and the reflecting wall, there are actually 52,500 electric wave-lengths.

Now imagine Prof. Hertz and this sapient editor of the *Independent* exploring with their "rectangular frame of wire four feet by six" for the half wave-lengths or nodes of interference of these electric ether-waves when 52,500 such wave-lengths occur within the distance of a single inch, or when more than 100 of them would be overtaken in passing that



wire-frame through the breadth of a single fine hair!!! Such is a fair specimen of the superlative nonsense which the editor of the *Independent* lays before his innocent readers, and asserts it to be sober scientific truth "without the least regard to Dr. Wilford Hall's theories or feelings."

One word, while on this subject, in regard to the true theory of the propagation of electricity. If electricity should be collected and liberated (we do not prefer the term *generated*, though it is frequently employed) by a dynamo-machine, the current is necessarily broken up and passed through the conducting wire, or by induction to adjacent wires, in the form of forces-pulses, or electric waves if you prefer it, not waves of *ether*, *air*, or any other substance, but of the substantial current of electricity itself. These pulses depend for their distance apart, or their so-called wave-lengths, on the number of rotations of the dynamo cylinder, or the number of times the collecting magnets pass each other in breaking up their magnetism and thus converting it into electricity. Should there be, for example, twenty of these breaks in a second, there would twenty electric pulses pass over the wire in a second, and supposing electricity to travel 30,000 miles a second, which has been approximately determined to be its velocity, these electric wave-lengths would be just 1,500 miles. Think of Prof. Hertz exploring in his laboratory, with his rectangular wire frame six by four feet, for the nodes of interference or the distance these pulses would be apart, by which to ascertain the fact that light and electricity travel with the same velocity!

The truth is the whole pretense of etheric light-waves or of comparing the so-called waves of light and electricity is the most ardent humbug that was ever imposed upon the gullibility of the readers of a great paper. Electricity goes in pulses, just as air goes in pulses, when the source of its emission is intermittent. But when electricity is let off from an unintermitting source, as from a liquid battery, a storage battery, or galvanic pile, it passes through the wire in a steady and continuous stream without any pulse-motion whatever, just as air or any other fluid will pass from an orifice under a steady pressure. How long is it to be before our educational institutions will cease this nonsensical inculcation of the motion-theories of science, and in their stead store the minds of our rising young men with the common-sense principles of Substantialism?

#### Eld. Isaac Errett Dead.

Our last number was in plates before we had heard of the death of the Editor of the *Christian Standard*, though as a singular coincidence we had remarked on page 30 that from information we had received we were now fully convinced that he had nothing to do with the bitter opposition to the Substantial Philosophy and to us personally that was constantly appearing in the *Standard*. From a long personal and intimate acquaintance with Bro. Errett, when we were young men together nearly fifty years ago, at the time he was preaching as a young evangelist in New Lisbon, Ohio, we learned to love him and greatly to admire him as a rising thinker and investigator. And knowing him in after

years, much better than he knew us, we were not at all disappointed at the marked prominence he attained before the religious world. Under these circumstances it can easily be imagined how pained we were to believe that our old-time friend had, for no imaginable cause, turned against us in the *Christian Standard*, and that he was using his great influence to damage the cause of Substantialism to which we were devoting our life. But here, in the shadow of his monument, we are glad to take back all such unwarranted misconceptions of his character, and to attribute any unfriendly opposition we are receiving to less worthy sources. And now, dear friend, good-by. You have done a noble work; you have made your mark, and you deserve the double immortality you are receiving.

#### Joule's Unit.—The Mechanical Equivalent of Heat.

Among the discussions which will interest the scientific readers of *The Microcosm* during the present volume will be the attempted overturn of the renowned heat-unit supposed to have been definitely established by Joule and Meyer. We foreshadowed this overturn in the May number of the *Scientific Arena*, Vol. I., in our article on "Some Mistakes of Ingersoll," in which we gave the basic grounds for what we claim as the fallacy of that formula. So important was this initial proof considered against the entire doctrine of Heat-Equivalence as taught by present science, that Dr. Henry A. Mott is now holding back his great work on the Substantial Forces of Nature, waiting for the final determination of the correctness or incorrectness of Joule's Unit by means of our contemplated experiments. These experiments would have been made long before this but for the writing of our book on "*Longevity*." In the next number or two we shall most likely be able to announce the results of our investigations of the Joule Unit.

#### Lectures on Substantialism Wanted.

The Editor of this journal would be very glad to be able to accept the many invitations sent him to go and lecture in different parts of the country. B. F. Faught, of Carthage, Mo., has written him twice offering \$100 a night for three lectures. We can only express our regret at our inability to accept these flattering invitations, and at the same time be able to do the work necessary at this office in pushing the *Microcosm* into the byways and hedges of Materialism. There are many persons eloquent and able, who could deliver effective lectures on Substantialism if they would thoroughly study the subject and then take the specimen lecture of the Rev. Dr. Crawford, printed in this number, as a general guide. Dr. Crawford's plan of *impromptu* answers to promiscuous questions and difficulties handed up from the audience, is a most effective method of unfolding the new philosophy, while at the same time furnishing an exciting entertainment to intelligent listeners. But it must be remembered that no one can dare to adopt that method unless completely read up in Substantialism. Hundreds of difficulties are liable to be shot at the lecturer, any one of which would completely swamp him unless he had previously stored his mind with the details of the subject as printed in the various

volumes of our Scientific Library of Substantialism. Judging from his writings, we believe that no man is better posted in all the minutia of the Substantial Philosophy than Dr. Crawford. He is a mode. student and investigator of physical science. We would be glad if hundreds would follow his example.

**Our Scientific Library Free for a Club of Twenty Subscribers.**

Many of our readers are asking how many subscribers they must get for the *Microcosm*, Vol. VI., to secure our "Scientific Library of Eight bound Volumes" as a premium. Last month we limited the number to twenty-four. We have decided to make a better offer, in view of largely increasing our circulation. We now propose to send those eight volumes by express as a premium to any person who will send us a club of twenty names at one time with the money—\$10. This affords an excellent opportunity to secure these volumes with a little labor and no cash, except for the freight. If sent by mail the postage, prepaid, will be \$1.25 extra. The chance to obtain this complete set of books, embracing the entire Substantial Philosophy, for \$5 cash, as offered on last page of this number, may not long be continued, as a party is already negotiating for the purchase of the plates and the copyrights. In such event these books will surely not be given away at cost as at present. A hint to the wise.

**A New and Powerful Magnet.**

We have just come across an imported steel magnet, claimed to be charged on a new principle making it vastly more powerful than any we have before seen. A five-inch magnet now in our possession, and which we use for illustrating the principles of Substantialism to all doubters, is as powerful as any twelve-inch magnet we ever used. These magnets cost 60 cents by mail post-paid, and which we will send to any who may need them. Those who wish to arm themselves against the powers of materialistic darkness, can not be better equipped than to be provided with a good steel horse-shoe magnet. Read the very able and suggestive paper of the associate editor on "The Magnet in Substantialism," elsewhere in this number.

**The Thesaurus.**

We are receiving many orders for this, one of the most wonderful works in the English language for all classes of students. Those having our "Scientific Library" will see a full description of this remarkable book in the Vth Vol. of the *Microcosm*, at page 128. It will be sent by mail for \$2.

**"Keely's Wonderful Philosophy."**

Well, we give it up again. W. T. Williams, of Cincinnati, Ohio, writes us: "I have waded through your article on the Keely philosophy, more because you wrote it than anything else. As a usual thing you write in very plain language, but you must have been a good deal confused for some reason when writing that article. I wish instead of using so many big words, you had told us plainly whether the Keely-Motor has developed any real power that is going to be of practical value in running machinery. I hope you are not deteriorating in your former clearness of

style!" etc. We are sorry for Mr. Williams as well as for ourself.

When Chauncey Depew was making his inimitable after-dinner speeches in his recent tour through England and perpetrating his side-splitting jokes—particularly so to those who comprehended them—he was happy in the self-congratulation that he had made numberless telling hits which would add to his reputation. But guess his surprise, on reaching his hotel in London, to find letters from nearly every place where he had dined asking him to explain the salient points of his best witticisms to settle wagers as to what he meant! Chauncey was so disgusted that he swore off from any more post-prandial jokes, at least till he knew beforehand who were to be at the table. And here we are in a similar fix. Our first attempt at being funny in the *Microcosm* is a failure. Nothing but the most serious science, such as Mr. Williams can comprehend, will be indulged in hereafter. Still, notwithstanding this setback to our aspirations, we have a grain of consolation. On the morning after New Years Mr. F. O. Irish, of Brooklyn, N. Y.—an intelligent and sedate deacon of a Congregational Church, and now nearly 80 years old—came all the way to this office to subscribe for the *Microcosm*, and to congratulate us upon the brilliant success of our opening article on Mr. Keely's "marvelously concise terminology." He told us that he never drank in so much concentrated amusement from a single two-page combination of words in his life; and added, as a piece of news, that a New Years' party which filled the parlor at the parsonage the day before, were kept convulsed with laughter for nearly half an hour while the minister was reading that same Keely-Motor article which Mr. Williams so deprecates.

**The Second Volume of the Arena.**

It is known to most of our readers that only the first Vol. of the *Scientific Arena* has been bound in book form. We are receiving many inquiries about Vol. II.—when it will be ready, etc. We answer all such inquiries that the second volume has not yet been printed and bound in book form, and that there are no back numbers left in pamphlet form, except December number. We now want to know how many of our subscribers would like to have that volume to complete their library of Substantialism. If 250 persons will agree to take a copy at \$1 by mail—no money being required till it is ready—we will commence preparing the edition. A less number than 250 copies would not pay the cost. Many of the old subscribers regard that volume as the cream of our scientific series. Those desiring it should answer at once.

**The Rev. E. R. McGregor's Book—"Patmos."**

Last month, at page 25, we referred to this truly meritorious book which we have had the pleasure of reading in manuscript, though our notice did but scant justice to the abilities of that writer. In our remarks we spoke of the work as ready for the bindery. Bro. McGregor now writes us that we misunderstood him, and that we were a little too previous, so to speak. His publisher, he wishes us to say, has his book in hand, and is ready to print and bind it as soon as 500 subscribers shall agree to take a copy each at

\$1.50 There is nothing to be paid till the book is ready to mail.

In addition to furnishing the book to all such subscribers, the author, who is a thoroughbred Substantialist, volunteers to devote the entire net profits of the first 1,000 copies (40 cents per copy) to the free distribution of the *Microcosm* among the schools and churches. Thus the readers of this paper who may subscribe for that book will know that in so doing they are spreading Substantialism. All such friends will send their names at once to the author at Ballston, Va., and thus doubly aid in the cause of truth.

#### Struggles and Triumphs of the Truth.

This is the title of a new book of 350 pages, 12 mo., from the pen of J. W. Lowber, Ph. D., LL. D., of Fort Worth, Texas. The style and ability of Dr. Lowber are familiar to most of our readers, as he was for several years among our old and reliable contributors to the *Microcosm*. He was among the few whose articles we never thought it necessary to read before printing them, though we generally did so from the pleasure they gave us. His present book we have only had time to glance through in the midst of our incessant labors for the extension of the *Microcosm*; but we have seen enough to convince us that the work sparkles from lid to lid with intellectual scintillations of a high order. The price of the book is \$1.50, and will be sent post-paid by the author if addressed as above. Robert Rogers, our associate editor, has the book, and in some future number will give a brief epitome of its salient discussions. It is sound on Substantialism.

#### Important to School Teachers.

We send a few sample copies of this number of the *Microcosm* to school teachers whose names have been sent to us by their superintendents. To such teachers we say, that they should not only take this paper to keep abreast of the times on scientific and philosophical subjects, but especially should they have Dr. Swander's "Text-book on Sound," which contains more valuable and suggestive scientific information than any work of its size in existence. It is bound in cloth, price by mail, 50 cents. Any regular teacher who will subscribe for this volume of the *Microcosm* (50 cents), will receive the Text-book on Sound free as our small contribution to scientific progress.

#### Items of Interest to Subscribers.

Any person who may receive a sample copy of this number, and who may not wish to subscribe till they have seen more of the *Microcosm*, can have the December or January numbers free, by sending for it. We want all to be fully satisfied, before subscribing, that they will get the worth of their 50 cents. All subscriptions, remember, begin with the December number—or the first of the volume.

Still our sixteen page *Microcosm* is too small for what we wish to print monthly. Indeed, we do not have more than half room for what we wish to communicate. But no more than these 16 pages can be afforded monthly for 50 cents a year. We have many excellent articles which we had set apart for this number—one especially from Prof. Henry C. Cox, of Chicago, which we had promised—which will appear next month.

The "Problem of Human Life" (524 large double column octavo pages, cloth, \$2 by mail), was the first book of our scientific series. This volume contains the seeds and fundamental principles of the Substantial Philosophy, and as a single book is the most important of the series. But it has led up to seven other volumes, making eight in all, now published in book form, which are known as our "Scientific Library"—retail price \$11. This entire library, for a limited period, will be sent by express for \$5 (absolute cost), or by mail, with \$1.25 added for postage, making \$6.25. Ministers from all sections of the land are hastening to avail themselves of this unparalleled offer before the plates and copyrights shall fall into other and more avaricious hands, an event within the probable possibilities.

We have several sets of "Appleton's Encyclopædia," second hand but in excellent condition (not the illustrated edition, but the one previous), 16 large 800-page volumes, in leather binding \$30; or in cloth \$24. Either set is worth to any student double this amount. Let no man complain after this that he lacks the facilities for obtaining universal knowledge, a thing which is only possible with a good encyclopædia.

We have letters from a number of bright and critical writers on Substantialism who are studying the subject anew, with the intention of trying for one of our cash prizes. We offer \$30, \$20 and \$10 in cash for the best three Prize Essays during the year. See last page of last issue. To try this, however, with any chance of success, the writer should own the "Scientific Library of Substantialism," and then study it. Both Dr. Swander and Dr. Crawford have agreed to enter the lists with a couple of articles each, during the spring and summer. This will prove an exciting feature of our little monthly during the present volume. Who knows what at present unheard-of Substantialist may strike a train of inspirations that will startle the judges and carry off first prize?

Just on going to press we have received two very interesting letters. One was from the Rev. Dr. Crawford, whose splendid "specimen lecture" on Substantialism appears elsewhere in this number. He sends a good list of subscribers and speaks enthusiastically of his prospects in the lecture-field; and thinks that many eloquent young men might find useful employment in this open harvest now ripe for the sickle. The other letter was from the Rev. Dr. Swander of Fremont, Ohio. He wishes us to say that he is in active co-operation with the associate editor in his project, as set forth last month, to dispose of copies of the "Substantial Philosophy" with a view to memorializing the 70th birthday of a certain editor, whose name would be mentioned but for his extreme modesty. But the doctor says he is not a bit modest in claiming that every Substantialist ought to own a copy of that work as a book of reference. Price by mail \$1.50 Address Rev. J. I. Swander, D. D.



# The Microcosm

A MONTHLY JOURNAL OF SUBSTANTIALISM AND COLLATERAL DISCUSSIONS.

THE ORGAN OF THE SUBSTANTIAL PHILOSOPHY.

**A. WILFORD HALL, Ph. D., LL. D., Editor and Proprietor.**

(Author of the "Problem of Human Life," "Universalism Against Itself," Editor of the *Scientific Arena*, &c., &c.)

**ROBERT ROGERS, S. L. A., Associate Editor.**

Address all communications to A. WILFORD HALL, 23 Park Row, New York.

Vol. VI.—No. 4.

MARCH, 1889.

50 Cents a Year.

Entered as second class matter at the New York Post Office.

## THE HYDROSTATIC PARADOX AND THE LOCUST.

DEAR DR. HALL:

Are you not mistaken in supposing that the locust must necessarily do the work of many locomotive-engines according to the wave-theory of sound, in filling four cubic miles of air with its music? According to the "Hydrostatic Paradox," as set forth in the *Scientific Arena*, vol. I., page 89, by you and Dr. Mott, it appears that a single pound pressure on a frictionless piston entering a closed tank of water is capable of duplicating that pressure thousands or for that matter millions of times upon the interior of the tank and upon its contents. Is it not upon an analogous principle that the locust is able to fill four cubic miles of air with its sound waves according to the current theory of acoustics?

Very truly yours,  
HENRY B. HUDSON

"Witness" Office,  
New York, January 2d, 1889.

### REMARKS BY THE EDITOR.

The foregoing objection to our locust argument is suggested by Mr. Hudson, not so much because it presents a real difficulty to his mind—for he is too well informed on Substantialism for that—but to elicit a concise and conclusive answer as a matter of permanent record in the *Microcosm* for the assistance of coming Substantialists, knowing as he does that many advocates of the current motion-theories of science seize upon this apparent difficulty as a fair way of offsetting our locust reasoning. We are glad that he has suggested it, as it furnishes us with a most favorable opportunity, once for all to strike another blow against false science which nothing else could so well have inspired.

In the first place, let us say, that there is not the slightest analogy between the two cases. In the hydrostatic paradox there is only *static pressure* involved without *motion* or the performance of *mechanical labor* of any kind. 1. This requires that the fluid against which the pressure is exerted must be *inelastic*, the exact opposite of the highly *elastic* air in which the locust is said to perform its mechanical operations of condensing and compressing the air. A tank of air could not be compressed the slightest amount without involving motion and mechanical labor, the very reverse of static pressure. 2. It not only involves an in-

elastic and practically incompressible fluid, but it requires this fluid to be so confined as to leave no spare space for escaping the pressure; whereas the locust stridulates not only in the most elastic of fluids, but in the free air without any confinement whatever, and where any such idea as static pressure is wholly out of the question.

Instead of supposing such a monstrous absurdity as producing and repeating static pressure against the free air by the locust, let us help wave-theorists to a little mechanical science that is applicable to the case. As an illustration of the true difference between such multiplied static pressure and the mechanical performance of labor, let us suppose a million thin plates of metal stacked in a pile, each plate weighing half an ounce, or many times more than our locust could lift by exerting all its strength. Now, suppose this locust to weigh one pennyweight, and that it chances to light on this pile of plates. It is plain that the insect not only produces a static pressure of one pennyweight on the topmost plate, but that this pressure of one pennyweight is transferred through this plate to the next one below, through it to the next, and so on down, pressing upon each and every plate one pennyweight to the bottom of the pile.

Common mechanics will assure every man, capable of scientific reflection, that each of this entire series of a million plates, in consequence of the pressure of that locust on the top of the pile, must press on the one below it with a static force of one pennyweight more than it would press if that locust should happen to fly away. In this way that insect would actually produce an aggregate multiplication of pressure the same as hydrostatic pressure, on the various surfaces of these plates of just 3,125 pounds, and that, too, without performing any mechanical labor whatever.

Should some superficial beginner in mechanics, like the editor of the *National Builder*, of Chicago, to whom we replied in the *Arena*, vol. II., page 26, ask why that pile of plates does not weigh 3,125 pounds more, in consequence of the locust lighting upon it, if the pressure be repeated on each plate to the bottom of the pile, we answer, because the pressure downward on any plate below, on the principle that action and reaction are equal, is repeated by that plate against the plate above, thus exactly equalizing the weight.

This single illustration, studied and carried out, is all that is needed to explain the almost endless multiplication of hydrostatic pressure,

and to distinguish it from mechanical labor such as the locust has to perform, according to the wave-theory, in churning four cubic miles of air into condensations and rarefactions and keeping them up at the rate of many hundred alternations a second for nearly a minute at a time.

Let us now look for a moment at the nature of the mechanical labor that has to be performed by the locust if there is a grain of truth in the wave-theory of sound, in thus filling the four cubic miles of air with its stridulations. The wave-theory does not leave us in the least doubt or uncertainty on the subject. We have only to examine one of the highest authorities on sound for a few moments to learn what this insect must perform as actual labor, if that theory be true, as now everywhere taught in our schools. Prof. Tyndall says in his Popular Lectures: "Imagine one of the prongs of the vibrating fork [or the vibrating body of the insect] swiftly advancing: it compresses the air immediately in front of it, and when it retreats it leaves a partial vacuum behind, the process being repeated by every subsequent advance and retreat. The whole function of the tuning-fork [or of the vibrating locust] is to carve the air into these condensations and rarefactions."

Now the locust, according to this unquestioned authority, in filling a given space with sound, actually performs the mechanical labor of carving that entire mass of air into condensations and rarefactions, otherwise it would not be carved. Not only is the air thus filled with sound carved, condensed and rarefied by the physical strength of this insect, but it is thus manipulated with sufficient dynamic energy to generate, according to the theory, heat throughout that entire cubical area sufficient to increase its elasticity and thereby add 174 feet a second or about one-sixth to the velocity of the sound. Plainly, such mechanical compressions, and their rapid change to rarefactions, alternating hundreds of times a second, and that, too, with an energy sufficient to manipulate the free air (requiring thousands of times more energetic effort than to condense any amount of air confined in a tank), must involve physical strength and exertion of a character as strictly mechanical as that of the plowing of a field by a team of horses, or the drawing of a train of cars on an up-grade by a locomotive. Let us see if this is really the teaching of the wave-theory of sound which "Dr. Wilford Hall of New York has the audacity to oppose." Prof. Tyndall goes on:

"Figure clearly to your minds a harp-string [or the body of a locust] vibrating to and fro, it advances and causes the particles of air in front of it to crowd together, thus producing a condensation of the air. It retreats and the air-particles behind it separate more widely, thus producing a rarefaction of the air. The string [or the body of the locust] again advances, and produces a condensation as before; it again retreats and produces a rarefaction. In this way the air through which the sound of the string, [or of the locust] is propagated is moulded into a regular series of condensations and rarefactions which travel at a velocity of about 1100 feet a second." \* \* \* "A sonorous wave consists of two parts, in one of which the air is condensed, and in the other of which rarefied." \* \* \* "In the condensed portion of a sonorous wave the air is above, in the

rarefied portion it is below the average temperature." \* \* \* "This change of temperature, produced by the passage of the sonorous wave itself, virtually augments the elasticity of the air, and makes the velocity of sound about one-sixth greater than it would be if there were no change of temperature." \* \* \*

"When a body capable of emitting a musical sound—a tuning-fork for example—vibrates [or when a locust stridulates], it moulds the surrounding air into sonorous waves, each of which consists of a condensation and rarefaction," etc., etc. (see these and other quotations in full as given in the "Problem of Human Life," pp. 78, 79).

Now it is like running one's head against a stone wall for advocates of the wave-theory to try to ignore the enormous amount of mechanical labor which present science imposes upon the locust in compelling it to fill these cubic miles of air with condensations and rarefactions, "carving," "moulding" and alternately heating and cooling the entire mass by mechanical compression and expansion hundreds of times a second, thus augmenting its normal elasticity sufficiently to add one-sixth to the velocity of its sound.

If we bear in mind that one cubic inch of air, even with the thousand-fold advantage of being confined in a tube, can not be condensed a thousandth part of its bulk so as to raise its temperature the slightest fraction of a degree, without the expenditure of a calculable amount of mechanical energy, what enormous physical labor must the locust perform in thus condensing these countless millions of cubic feet of free air hundreds of times a second!

Prof. Mayer, however, drives and clinches this fatal nail in the coffin of the wave-theory by actually calculating the amount of condensation which a given sound produces above the ordinary density of our atmosphere. Tyndall did not dare touch it. Helmholtz was too far-seeing a scientist to risk his reputation upon it. Lord Raleigh knew better. So it was left to the great American physicist of the Stevens Institute at Hoboken, N. J., to deal the fatal blow to that theory and thereby ring the death-knell of every other motion-theory of science. He tells us in his article on sound in Appleton's American Encyclopædia, that a sound at the pitch of C, about that of the locust, passing through the air increases the condensed half of the waves 1-679 above the normal density of the air. There is no mistake about this. Here is his exact language: "This compression gives for the compressed half of the wave an increase of 1-679 to the ordinary density of the atmosphere."

Now when we remember that it takes one atmosphere of dynamic force, or fifteen pounds of mechanical labor to condense a cubic inch even of confined air to one-half its volume, thus to double its density, it is but a simple sum in arithmetic to find the number of cubic inches in the four cubic miles condensed by the locust, and then to calculate what amount of mechanical labor it must take to condense each of these cubic inches 1-679 of fifteen pounds.

We have shown by a careful calculation in the "Problem of Human Life," and also in the different volumes of the *Microcosm* and *Arena*, that even if each separate inch of the four cubic miles of air were confined, such an almost inconceivable amount of condensation would require the locust to exert a physical

energy of more than 5,000,000,000 tons, and thereby to do the work, for a minute at a time, of more than one million locomotive-engines! Yet there are thousands of generally-intelligent and morally-honest college professors in this country so blinded by their prejudices against reading our books that they are now teaching their classes this monstrously false and perniciously absurd theory as true science, and many of whom curl their lips with scorn whenever their attention is called to the Substantial Philosophy! How long, O Lord, how long?

PRIZE ESSAY No. 4.

The Substantial Philosophy, No. 1.

BY REV. JOHN CRAWFORD, D. D.

Substance is that which sustains attributes, or that in which attributes, or qualities, inhere. The word is derived from the Latin *sub* (under), and *stare* (to stand), that which stands under, or sustains qualities. All substances are, therefore, entities, while their qualities are only phenomena, which have no existence apart from the substances in which they inhere. All substances are divisible into two classes—material and immaterial.

Material substance, or matter, possesses weight, inertia and impenetrability; while, on the contrary, immaterial substance has no weight, but possesses power, or force, and is capable of occupying the same space, at one and the same time, as other material or immaterial substance.

All spiritual existences, such as the immaterial organism in man, brute and vegetable; and all angelic spirits and demons, and even the great Spirit, by whom all other substances, material and immaterial, were made, and are sustained, are immaterial substances.

Besides these, the force-element of nature, whose various forms constitute heat, light, electricity, magnetism, gravity and sound, is also, according to the Substantial Philosophy, an objective substance, having qualities inhering in it and is not, therefore, as commonly taught a mere phenomenon of nature. Neither are these physical forms of force modes of motion; but they have an existence as real and objective as rock and iron. The difference is that, while the latter are material, the former are immaterial.

It is, no doubt, correct to say, as here intimated, that there is but one universal force-element in nature which is capable of these numerous manifestations known as the physical forces; for it can be proved that these various manifestations are frequently changed into others. Electricity, for example, may become heat, or light, or magnetism; and heat changes into light; cohesion takes the form of heat or chemism; and these again may resume the form of cohesion. Even gravity appears to be capable of conversion into magnetism, as when silver passes between the poles of an electro-magnet, its gravity seems to be partially changed into magnetic force.

These changes of manifestation do not, however, take place in an arbitrary manner; but are ruled by the relation which, at the time, the force-element sustains to material objects involved. For example, if certain material substances are subjected to friction, electricity, light and heat are thereby called

forth. Again, if sonorous material substances are caused to vibrate, sound is evolved; or if electricity be partially interrupted in its course, it may escape in the form of light and heat.

Besides this universal fountain of natural force, there is, as I conceive, another immaterial element of force, entirely distinct. I mean that which supplies the substance of the immaterial organism in man, brute and vegetable, which might, perhaps, in order to distinguish it from the physical force-element of nature, be called the *vital force-element*, as it always manifests itself as living substance, whether in animal or vegetable.

As the material organism in man, brute and plant grows, or increases in size from the addition of substance from the world of matter, so the immaterial organism ought also to grow, in order to fill the material which it weaves for itself and inhabits. We have no reason to believe that the first man had a larger proportion of immaterial substance than other men. But, as man and beast multiply, there must be, for this increase, a supply of immaterial substance from some source. Man, beast and vegetable receive but the first germ of their living immaterial organism from their parents. All increase, therefore, as I conceive, must be supplied from this universal life-fountain or vital force-element.

Although the physical force-element and the life-element are both forces, for both exert power, which matter never does, being essentially inert, we have no evidence that the one is ever transformed into the other. Electricity may be transformed into light or heat; but never into life; nor life into electricity. Although electricity may permeate and affect life, neither electricity nor any form of the physical force-element is ever transformed into any portion of the spiritual or vital organism in man, brute or plant. There is no example or evidence of such a transformation, nor is it reasonable.

The material organism is in a state of constant flux. It is constantly receiving and casting off material substance; but we have no reason to believe that the spiritual organism ever diminishes, although a life-germ may be communicated by parents to their offspring. When substance is once added to man's spiritual organism it becomes henceforth a part of that intelligent and responsible soul-substance which is to endure forever. This quality it derives from contact, and union, with the original life-germ. This view supports and vindicates traducianism as against creationism; but I forbear to pursue this question further.

If it can be proved that the irrational and irresponsible brute is not designed for a future existence, its immaterial spirit or incorporeal organism may, therefore, at death, be relegated back to the universal life-fountain whence it came.

Now, if the above positions be correct, the common division of the universe into *mind* and *matter* only, is inadequate. The Rev. Joseph Cook says, "Only matter and mind exist in the universe." So also says the textbooks. Now this excludes from the universe the physical forces of nature, for they certainly are neither mind nor matter; and, if they are not distinct substances they can be nothing but attributes of matter, or mere modes of motion, which is the common teaching of the



colleges and text-books in which Mr. Cook has avowed his belief. The Substantial Philosophy, on the contrary, maintains that they are as real, although immaterial substances, as is the soul, mind, or spirit of man, or as is the earth we inhabit. If the common teaching be correct, electricity, light, heat, magnetism and all other natural forms of force, because immaterial, are nonentities—either qualities of matter or, as the text-books say, modes of motion; and, if so, the soul of man, and even the divine spirit, because immaterial, can, upon these principles, be no more than mere motions or phenomena! When, therefore, the body is dissolved at death, the soul becomes extinct; or, if the universe were destroyed, God himself would have no existence! Now this is precisely the conclusion from the common teaching, at which the atheistical Prof. Hæckel and his followers have actually arrived. He says, "If sound, light and heat, forces of nature, whose phenomena are so sensibly observed, are the varied motions of material air and ether particles, as physical science indicates, why have I not a right to assume, and teach, that the mind-force, life-force and psychic-force are also modes of motion of the material particles of the vibrating brain and throbbing nerves?" It is obvious, indeed, that the present materialistic teaching of the schools, that the forces of nature are but modes of motion, leads to atheism.

Those who admit the soul of man, angelic spirits and God himself, the great spirit, to be real existences, although immaterial, are most inconsistent in denying the substantiality of the forces of nature, on the ground of their immateriality.

In conclusion, let the universe be divided into material and immaterial substances, rather than inadequately into mind and matter only; and let all the absurd and unscientific "mode-of-motion" theories be forever banished to the territory of learned ignorance whence they came. In other words, let Substantialism supersede the common teachings of our schools, and true science will get a new start in the right direction; and the word of inspiration, vindicated against the bareless charges and unauthorized perversions of science, falsely so-called, will have free course, run and be glorified.

St. Thomas, Dakota.

#### LIVE FROGS TAKEN FROM SOLID ROCKS.

We have many puzzles on this subject presented to us by our readers from different parts of the country. There are in fact so many evidences from candid eye witnesses, even some of them given under sworn statements, that live frogs have been found embedded in solid rock, coal, gypsum, etc., that it seems sheer hardihood not to accept such a simple fact, mysterious as it may appear. In the November number of the *Arena*, vol. II., we presented the details of such a discovery, with duly authenticated and sworn statements to verify it, of a live frog having been taken from a ledge of solid gypsum, where it positively must have been confined for thousands of years. We confess that we are not at present prepared to give a solution of this problem, or the rationale of its possibility, even remotely satisfactory to ourself. We have the puzzle under advisement, how-

ever, and hope to reach some sort of a conclusion after a while. In the mean time, if any of our readers can, in a very brief space, throw satisfactory light upon the question by way of explanation we want it. We do not mean mere *opinions*, for we can get thousands of them, but something in the shape of reasonable data and facts upon which to base conclusions. As Darwin says about the transmission of acquired characters and habits in animals—"Any explanation however improbable will be satisfactory."

#### Variations in the Barometric Column:

(A Theory.)

BY HENRY C. COX, A. M.

It is known that the downward pressure of the atmosphere under ordinary conditions and at the level of the sea, sustains a column of mercury, or other liquid, weighing fifteen pounds for every square inch of its base. It is known, also, that the height to which this column is held is subject to variation in the same altitude, thus proving a fluctuation in the downward pressure.

We have been content to say that the rise and fall of the mercurial column is due to the difference in the density of the air,—the denser the air the higher the mercury. But what connection is there between a rare atmosphere and falling weather or between a dense atmosphere and a clear sky? The air on a mountain top is rarer than that in its valley, but the valley gets the greater part of the rain-fall. The plain of Thibet, 14,000 feet above the sea-level, is a barren one, partly from want of rain, while the valley of the Ganges is most bountifully furnished with water.

The theory here presented is based upon the known facts of ascending and descending currents in the atmosphere. When for any cause, the air in a certain region is made specifically lighter than that of surrounding areas, it is driven upward and into its place comes the heavier propelling air. The fact of ascending currents in one section will suggest to the mind the presence of descending currents in others.

As the air leaves the surface in its upward flight it makes a push against the mass of air above it, thus neutralizing, in part, its downward pressure. In such case the column of mercury in the barometer is seen to go down. This air passing into regions colder than that left, its power to hold moisture is lessened, and rain or snow-fall is the result. The currents whose direction is downward, strike a blow the effect of which is to increase the downward pressure, causing the column of mercury to rise; and coming into a region warmer than that left, its power to hold moisture is increased. Hence it not only does not give out any, but it takes up that already present.

Thus is shown a connection between the falling barometer and rainfall, and between the rising barometer and a clear sky.

#### PROF. DOLBEAR ON THE TUNING-FORK:

A pitiable Fiasco as was to be expected.

BY THE EDITOR.

The reader will remember that in the January *Microcosm* (page 29), we quoted from the *Christian Standard* a letter from Prof. A. E. Dolbear, of College Hill, Mass., strongly com-

mending Prof. Thomson's book against Substantialism, and savagely denouncing the Problem of Human Life as a "piece of preposterous stuff having not a redeeming feature in it." In our remarks following said letter, we commended Prof. Dolbear to our article in the same number on the "Key to the main arch of Substantialism" as entirely unanswerable by him or by any one else, in which, if correct, the wave-theory of sound was literally crushed out of existence by a single original argument.

That argument, very briefly restated, was as follows:—If the wave-theory of sound be true and according to every authority on acoustics, the vibrating instrument of a given pitch which causes the greatest amounts of atmospheric disturbance, should produce the loudest sound, simply because *sound*, outside of our sensations, according to that theory, is nothing but *air-waves*, while loudness consists alone in the amplitude of swing of the vibrating air-particles set in motion by the sounding body. This, as the reader no doubt remembers, we proved by abundant quotations from Prof. Tyndall. Then to show that this basic and essential principle of the wave-theory is without foundation in truth we referred to the well-known fact that a tuning-fork held in the fingers and made to vibrate at its best, can not be heard more than six or eight feet away in a still room notwithstanding its wide amplitude of swing, and notwithstanding the powerful air-waves it sends off according to that theory; while a locust, of much less atmospheric surface and with not a tenth part the vibratory action on the air, emits a sound so loud that it is heard a mile in all directions—more than 800 times as far as the tuning-fork, while filling more than 80,000,000 times the cubical space with its sound.

This, as we there showed, demonstrates the wave-theory to be false in its very foundation principle, by proving that sound, either in its loudness or quantity, has nothing whatever to do with the incidental waves or disturbances of the air which occur near a sounding body. Surely, nothing in the domain of physical science has ever been more conclusively established than this proposition, provided the facts concerning the tuning-fork and the insect are correctly stated.

Having thus re-stated the argument so that none of its great importance to the cause of Substantialism shall be overlooked, we take pleasure in saying that we have heard from Prof. Dolbear. As the reader will see by reference to our January article we challenged any scientist to meet that argument or point out the least flaw in its conclusiveness against the current theory of sound. And now this distinguished indorser of Prof. Thompson's book shall have a chance to ventilate his genius in the *Microcosm*. Here are his words:

"College Hill, Mass., Jan. 24, '89.

"A Wilford Hall, P. H. D.

"I have received from you the January number of the *Microcosm* containing remarks about myself. \* \* \* Now for the article in this number which you are solicitous for me to read—'The Key to the main arch of Substantialism.' I have this to say After your argument you say—'For the overwhelming truth of the premises we give the following facts: A tuning-fork, held in the fingers, when caused to vibrate at its best, can not be

heard more than six or eight feet away in a still room.' That last part of the quotation you put in italics for emphasis. As a matter of fact it is simply *not true*. I have a tuning-fork which when made to vibrate and held in the fingers as you indicate, may be heard by ten thousand persons at once in still air. This 'Key to the main Arch' is misnamed a fact.

Yours etc.,

"A. E. Dolbear."

Well, this is all the eminent professor has to say in reply to our annihilating argument. He merely says we told an *untruth*,—that instead of a tuning-fork being heard only six or eight feet away, as we assert, he claims that he has a fork which when held in the fingers and vibrated as we indicate, "may be heard by ten thousand persons at once in still air." We retort that this "is simply not true" if the fork shall be held in the fingers and caused to vibrate as we direct,—that is, without the assistance of any resonant body, the same as the locust produces its almost deafening stridulation. And we say further, that if Prof. Dolbear tells the truth, and can produce such a tuning-fork as he describes, his fortune is not only made at once, but he will have achieved a scientific triumph with few parallels in history.

But suppose all he says about his prodigious tuning-fork to be true; does he not see that he has unwittingly given away the whole argument, acknowledged the wave-theory overturned by our locust, and confessed the truth of Substantialism? Does he not know that "ten thousand persons" can stand comfortably in a room 200 feet square? And what is that bagatelle of space compared to the four cubic miles of air filled with the sound of the locust? Our sapping professor did not seem to know that the area covered by the sound of the locust is more than 2780 times greater than that of his fork, even giving it all he claims for it. His vaulting ambition thus foolishly o'erleaps itself, notwithstanding the trick he tries to play with his wonderful tuning-fork. Does he think he can hoodwink the editor of the *Microcosm* with his "verbal jugglery" as he characterized the "Problem of Human Life" in his letter to the *Christian Standard*? Does he suppose he can find any substantialist green enough to be gulled by his legerdemain trick of holding a vibrating fork in his fingers over the mouth of a resonating jar to augment its sound so as to make it heard by ten thousand persons at once, and not have his game exposed? Yet with this very dishonest sleight of hand he asserts—"I have a tuning-fork which when made to vibrate and held in the fingers as you indicate," etc. Did we "indicate" any such thimble-rigging addition of the resonance of the jar to the normal sound of the fork? A beginner in acoustical science knows that the resonance of a jar of the right pitch, or of a wooden case would add a thousand-fold to the sound of the fork alone. Yet this professor of physical science, whose authority is relied on by the *Christian Standard* to damage the cause of Substantialism, has the cunning audacity to resort to this well-known trick by which, as the only possible resource to try to weaken the force of our argument! True science needs no such games of the trickster to maintain it. He knew he was deliberately falsifying the facts of a tuning-fork's normal sound, and was thus wickedly accusing us of falsehood by resorting

to the ruse of a prestidigitator. He knew that our statement of the tuning-fork's normal range of sound held in the fingers was substantially correct. But of course it would not do to allow this fatal argument against the wave-theory to go the rounds of the colleges and schools without being challenged, though he should have remembered that a fallacious and self-stultifying answer to a dangerous argument,—especially a pretended reply so easily turned against its author as this,—is a thousand times worse than silence. Why, then, did he not keep silent?

We are thus glad, in conclusion, to exhibit Prof. Dolbear to our readers as a fair specimen of the scientific authorities sought after and seized upon by our enemies with which to disparage the "Problem of Human Life," check the progress of Substantalism, and give a few more years of tottering existence to the fast-crumbling motion-theories of modern science.

### HERBERT SPENCER vs. HERBERT SPENCER.

BY REV. J. W. ROBERTS, F. S. SC.

In the *Popular Science Monthly* for November, 1880, a copy of which has just fallen under the writer's notice, in an article entitled, "*The Development of Political Institutions*," on page 4, Herbert Spencer uses this language: "But acceptance of the truth that the type of a society is determined by the nature of its units," etc., which is logical and in full accord with the philosophical statement that "the whole is but an aggregate of its parts or units, no more, no less."

Yet after this clear statement of a fundamental truth, in the same number of the magazine at page 107, in an article entitled "*Criticisms Corrected*," a reply to T. E. C. Leslie, in which, claiming to correct errors, the writer should be faultless himself, Mr. Spencer makes the assertion: "But the real question is, not whether we find advance to a more definite, coherent heterogeneity in these taken separately, but whether we find advance in the structures and actions of the entire society."

In both cases he is treating of the same general subject, the evolution of society from primitive to advanced conditions. In one case he accepts as true, that "*the type of a society is determined by the nature of its units*," in the other he finds that we are not to reach conclusions by the units "*taken separately*," but whether we find advance in the structures and actions of the *entire society*." The factors, or units, in one case are made the essential ingredients in the aggregate; in the other case they are ignored and the aggregates are to be taken as a *mass* and not in their *analysis*.

These antagonistic views put forth in the same issue of a *scientific* publication, by the great leader of "modern thought," are so stated and promulgated to establish the following proposition:

"Evolution is an integration of matter and concomitant dissipation of motion; during which the matter passes from an indefinite, incoherent homogeneity to a definite, coherent heterogeneity; and during which the retained motion undergoes a parallel transformation."

This is given as the "final form" of the definition of Evolution, after its process of "formula" from the beginning to completion, or finality. Without pausing to note the won-

derful lucidity (?) of this definition, or to call in question its ingenuity and its peculiar adaptation to the dogma it is "formulated" to propagate, it may not be out of place to note some of its manifest fallacies and unscientific statements. "Evolution is an integration of matter." If by this is intended to be taught anything more than the aggregation of matter, it is not correct. Evolutionists teach that by the "integration of matter" there is developed something that did not exist before; hence, that by this "integration" there has been developed from almost nothing all that exists in the universe, including intelligence. There is not now, and never has been in the past, any such process in Nature. When asked to state when, and show cause why, such process should cease, and why men are not now developed from the lower orders, the only answer is that the process has accomplished its work and ceases by exhaustion. Such an answer is without reason, analogy or science, is wholly gratuitous, and unworthy of a thinker or a philosopher. Analogies are attempted to be drawn from geology, which teaches the extinction of certain species of formerly existing creatures. Geology itself is an improved hypothesis, which will undergo much transformation before it becomes a science.

It is quite uncertain how many of the supposed extinct species of primeval periods are really extinct. If the oceans could now be upheaved by volcanic force, or other convulsions of Nature, it is altogether probable that in their hidden recesses all or nearly all the extinct orders would be still found in existence. The huge beasts of the mammoth order, like the buffalo of our time, may have been extirpated by processes which are visible and involved in no uncertainty or ambiguity.

The only "integration" of matter that ever has existed, or exists now, is that of the accumulation or aggregation of previously existing matter, and the aggregation contains no new matter that did not previously exist in the separate parts or units of the mass aggregated. Hence the scientific axiom, that out of nothing something can not come. It matters not whether the something comes out of absolute nothing, or whether it is evolved out of something that already existed, so that it be a something which did not previously exist in anything; for in either case it is an absolute creation of something that previously had no existence, and is, therefore, to all intents and purposes, the production of something out of nothing. And so Evolution is a *system of creations*, each one of which is as absolutely a miracle as the old theological dogma that God created all things out of nothing. This is so plain a proposition that it is practically self-evident, and from its all-embracing and iron grasp there is no escape by either evolutionists pure and simple, or the less logical theistic evolutionists, who mix God and evolution in an incoherent jumble.

The other horn of the Evolution dilemma is "the concomitant dissipation of motion." Why not say "the concomitant dissipation of nonentity?" for it is non-entity that disappears, and entity that takes its place, if Evolution be true. Evidently Mr. Spencer does not know what motion is, he accepts without question or analysis the *theory* that motion is a *force*, in fact the force of the material universe; whereas it is not force at all,



but only the effect of the application of force to matter or substance; and the amount of force applied is measured by the amount of motion produced. This statement is so self-evidently true, that its statement is all that is required in its proof. All mechanical appliances, simple and compound, are based on this great and fundamental law, and there is not a piece of machinery, great or small, that is not constructed and operated on this principle. Hence, if Herbert Spencer's definition is correct, the "dissipation of an effect"—in itself nothing—produces by concretion or "integration of matter" a universe! In other words, a universe is created *by nothing*, which is certainly quite as bad as to be created *out of nothing*!

Why do not men stop and think? Why mock reason by sophisms which have no foundation? Why build hypotheses upon a fog-bank or the "baseless fabric of a vision?"

Motion is the result of applied force. Momentum is the continued application of the force multiplied upon itself, each unit of force as it is applied, being "stored up" in the object moved, and by that means multiplied, the multiplication being limited by the amount of force applied. The proof conclusive of this proposition is found in the fact that as soon as the force ceases to be applied, the momentum begins to decrease, and finally all motion ceases.

With such clearly demonstrable facts before them, why will men stultify themselves and "darken counsel" by the promulgation of theories which their own intelligence ought to shame out of countenance?

With these plain facts in view, how ridiculous appears the conclusion of the definition: "during which the retained motion undergoes a parallel transformation." Will Mr. Spencer or any of his friends show us a specimen of that "retained motion?" What does it look like? If it is retained it ought to be tangible in some shape. Please give us a piece of it. We have an earnest desire to examine it and test its qualities, the units of its parts and then its "heterogeneity." Come, now, ye mighty men, "trot out your samples" and give us an exhibition! One sample of "retained motion" will accomplish more for Evolution in a minute than all the arguments you can produce in a century. Give us the "short cut" and save time and trouble.

#### Theosophy—Its American Head.

[From the *New York World*.]

Dr. Coues, the distinguished Smithsonian Professor who is at the head of the Theosophists in this country, made a very remarkable statement to me the other day, just after *The World* had printed my brief personal sketch of him. I asked him a number of questions seeking an explanation of his going into the field of mysticism. For years he has been a Materialist. I was curious to learn how he had passed over to the other extreme. Dr. Coues said that he was led into it through a scientific investigation of Spiritualism. He found much in that that was astonishing and incomprehensible. From that he has passed to the advanced field of Theosophy. Two or three years ago when he was in London he was associated with Mme. Blavatsky and Mr. Olcott. Through them he was initiated into the inner circles of Theosophy. When he returned

to this country he found himself suddenly placed at the head of the Theosophists in this country. I asked him if he claimed that he could project his astral body. He said that he claimed nothing in regard to it. It was his friends who made these claims. Several of his friends had seen his astral form at a distance when his real body was known to be in another place. Dr. Coues was asked if he had found anything in this field of mysticism which could be proved to any of his scientific associates. He said no. No scientific man without four or five years preparation would be prepared to judge of the testimony which he and his associate Theosophists had discovered. The remarkable part of the Doctor's declaration came at the close of the conversation. He was asked if he had found anything of a satisfactory character in the field of Spiritualism or Theosophy. He replied: "No; there is nothing in it to satisfy any one. The happiest people are those who have never touched it. I am tired of the whole thing, and intend to resign my connection with the Theosophists very soon. I find that I have all the fools, all the cranks, all the soft-headed people of this country hanging on to my coat tails. There is much in this field that is convincing to any one who investigates that there is another life, but such investigation leads to dissatisfaction and unrest for strong minds, and is certain to unbalance and upset weak ones. I feel confident now that if I had not had a clear, well-educated mind I should have gone crazy long ago and broken down under the line of research I began four or five years ago. I repeat," he said, with a great deal of emphasis, "that those are the happiest who let such subjects completely alone. To the man who is upon the eve of investigation I have simply this to say—don't." T. C. CRAWFORD.

#### SPIRITUALISM AND THEOSOLOGY.

BY THE EDITOR.

Some recent investigations by scientific men, as published in a leading London journal, have led to the conviction in their minds that there is a degree of truth in the phenomena claimed to be witnessed in the mediumistic seances so common all over the country. This state of facts the investigators referred to aver to have a foundation, notwithstanding the trickery and frauds so prevalent and so often exposed of late.

It is urged by many sincere religious people that it no more refutes the claims of spiritualists to the general genuineness of Spiritualism thus to detect frauds, than the false Christs of the apostles' time disproved the truth of Christianity. It would, however, be a very interesting matter, if there is anything true or genuine in the claims of modern Spiritualism, for the scientists referred to who have thus vaguely half indorsed it to say right out and definitely how much truth there is in modern Spiritualism and whether or not any one thing has ever been exhibited through a medium which proves a genuine communication, true or false, from any person who had previously died.

Either the scientific investigators referred to must admit this much or else there was a foolish and whimsical admission in their report entirely misleading and unworthy of the name of scientific investigation. If no such palpable and unquestionable communication can be

averred by these scientists, then the whole thing is unworthy of belief; for this simple, tangible proof is the least that these mediumistic pretenders should expect thinking men to be satisfied with.

But if, on the other hand, there is indisputable proof that one single communication from the other world has ever been uttered through a medium, then there should be an unqualified indorsement of Spiritualism as scientifically true, however many frauds and failures may have been exposed. Give us one single word or intelligent rap or tip of a table or chair not produced by human agency, or mechanical contrivance by some one in the flesh, and we accept at once as a philosophical truth the entire system of Spiritualism with all that the term implies.

One professor of science who is a frequent visitor at the *Microcosm* office denies that he is a spiritualist, or a believer in the doctrine of Spiritualism, yet he insists that he has frequently had intelligent communications, true or false, from the other world where no collusion or trickery was possible. When asked how he explained it, he referred it to evil spirits, because, as he said, they did sometimes lie.

Now we declare here that we will be just as well satisfied to have an intelligible communication from a devil as from an angel, so far as the supernatural fact under consideration is concerned. In a single word, we do not believe that any living medium of the thousands going over the country lecturing and holding seances from Dr. Henry Slade down, ever had one single word, rap, scratch of a pencil, or movement of a piece of furniture caused by demon, angel, or disembodied spirit of any kind, or any manifestation whatever that could not readily be explained on ordinary scientific and mechanical principles by a man competent to do so.

If any medium in New York or elsewhere, who claims to receive super-corporeal manifestations, will give us one such occult and tangible proof which unmistakably emanates from the spirit-world, we shall ask no questions as to whether it be from a good, bad, or indifferent spirit, or whether the communication is of any importance or contains any truth, so it is only not from the tricky medium himself or from his confederates, we pledge our word to give due credit in the *Microcosm* to such fact.

Instead of wasting these seances on a lot of simple-minded and ready-to-be duped old men and women who know nothing of the fixed principles of mechanics or of the true methods of scanning and weighing such pretended supernatural claims, and who, as a rule, are only too willing to accept any sort of proof of a communication from some lost friend without questioning it, let the mediums who are not afraid of exposure (if there be any such) invite the editorial staff of this journal to a special seance, and if the performance shall embody one genuine word, appearance, sound, or movement from the other world, or manifestation which can not be plainly accounted for by natural and ordinary means, then we promise to give the said medium a send-off in the *Microcosm* such as he has never before received. Let mediums all over the land take notice that there is no bigotry about this office, and that we are ready to become outspoken

converts to Spiritualism just as soon as any medium is prepared to give us the proof.

As for Theosophy, it is in our judgment but transcendental Spiritualism, in the disguise of a higher and more mystified spiritualistic philosophy. Theosophy is no where nearly as palpable and tangible a pretension as outright Spiritualism. This modern system tips a table, haps out yes or no, scratches a communication on a slate that mortals can read, and that is the end of it, even if it is a slight-of-hand performance.

But Theosophy, more pretentious than its modern offshoot, with occult legendary symbols and secrets, talks to us about the elixir of life, about our astral body, or double ego, manifesting itself in two places at the same time, and a score of similar abstruse impracticabilities which virtually make a nully of many of the established physical laws, and there it leaves us.

We confess we know little about Theosophy and care less, as we have a more excellent way. Until Theosophy will come right out as does Substantialism, and lay down its tangible principles, based on the established facts and analogies of nature, and stop hinting at dark and occult secrets that its adherents dare not whisper above their breath, we want nothing to do with it or its advocates except to convert them.

If Dr. Coues, the distinguished Smithsonian professor and the leader of Theosophy in America, had desired to break the shackles of materialism, as he states, that had so relentlessly bound him for these many years, he need not to have gone to Hindoostan or to have taken lessons from Madame Blavatsky. Substantialism was right at his very door—a system of philosophy which would have crushed every vestige of materialism out of him while he was packing his trunk to take ship for England. This philosophy will demonstrate to any man who has brains enough to think a half-dozen consecutive thoughts, that he has a substantial, incorporeal soul within him, as really and as certainly as that a magnet has an immaterial, substantial force within it that will go out, seize a piece of iron and lift it bodily. Let persons troubled with materialistic doubts concerning a hereafter for humanity try our remedy before starting for India, and if it will not produce a radical cure of their skepticism, they have our full permission to test the virtue of the esoteric prescriptions of Madame Blavatsky.

#### TOWARD THE MARK FOR THE PRIZE.

BY REV. J. I. SWANDER, D. D.

Several prizes have been offered for the best original essays on Substantialism or kindred subjects contributed to the *Microcosm*. The writer of this article has been urged to sharpen his pen and enter the field as a contestant for one of these sums of money. After giving the matter due consideration, he has concluded to respectfully, yet positively, decline the invitation. Several reasons might be assigned for the position thus taken, any one of which is sufficient to justify him before the bar of his own conscience.

Though declining to enter the list as a competitor for one of these prizes, he wishes in this connection to acknowledge his full appreciation of the spirit and approval of the pur-

pose that doubtless prompted the founder of Substantialism to make such a generous offer. Dr. Hall's action in this particular case is in harmony with the many deeds of liberality which are among the distinguishing traits of his character.

Neither is it the purpose of this paper to cast any reflections upon those noble sons of laudable ambition who are already stripping for the contest, and stepping into the arena toward which so many eyes are casting glances of interest and anxiety. The writer asks only for the privilege of taking his position in that great cloud of witnesses by whom the contestants will be surrounded, and who will be looking down upon them from the crowded galleries of the amphitheater. This privilege is to be construed as implying the right to share in the pleasurable emotions of admiration and curiosity which are already seizing the wide-awake readers of the *Microcosm*, and placing them on tiptoe of anxiety concerning the outcome of the exciting contest.

The writer herewith submits his principal reason for the declination announced. He is already under a debt of gratitude to the founder of the Substantial Philosophy for the most incisive literature that he has ever had the good fortune to meet with and study in the department of physical science. Dr. Hall has bequeathed to the world a fund of wealth more valuable than gold, yea, than much fine gold. He has given the fruits of the discovery of a fundamental truth in philosophy, compared with which the diamonds of the earth are as dross, and all the glittering things in the merely phenomenal side of the universe as the dust of the balance. Of this wealth have all his diligent disciples received, truth for truth—not trash for truth, as is so frequently the case in much of the current teachings of physics and metaphysics in the schools. The sentiments expressed as above are common to all earnest searchers after the truth on this side of—the dark regions of materialism where the worm of sophistry continueth to wriggle, and where the fox-fire of motionism is not yet quenched.

Nothing but a combination of educated ignorance and unpardonable bigotry will hesitate for one moment to acknowledge that the wealth of the Substantial Philosophy is as incalculable as its radical discoveries are genuine, and its logical arguments unanswerable. This revolutionary system has now been before the public for more than a full decade of years; and who hath convicted it of the sin of unscientific jugglery? Those who have attempted to expose its alleged weakness have experienced the telling blows of its real strength. Neither is there a scholar of respectable attainments in this country justified in pleading ignorance of this great movement in philosophy. It has announced itself to the full extent of the means at its command. It hath sent forth its maidens to cry upon the high places of the city. Materialistic philosophy has been confronted and challenged in every step of its progress. The newly announced truth has cross-questioned itself and allowed itself to be interrogated in open court. It has modestly and yet fearlessly entered the colleges and universities of the world, asking for a fair and merciless investigation of its claims by those who have all the appliances necessary to detect a fraud in any

unscientific pretention. And what is the result? Has Substantialism been found inconsistent with itself or in conflict with any of the obvious facts of nature? Not a bit of it. Upon the other hand, thousands of critical scholars have yielded their full assent to the radical superiority of its claims over the old molecular theories of science, and are now telling to sinners round what a priceless jewel they have come to possess. When tried by the test of its conformity to the pattern that came down from God out of heaven, it has shown itself in harmony with the teachings of the Holy Scriptures. Call the roll of God's most progressive and yet cautious people, and thousands of the best men and women now living will tell it as a part of their truly Christian experience that their apprehension of the Substantial Philosophy helped to sweep the remaining mist of doubt from their eyes, enabled them to see light in God's light, and confirmed their belief in the immortality of the soul, and in the superior reality of those immaterial things, both in heaven and in earth, which eye hath not seen and which ear hath not heard.

Why, then, should not the possession of these invaluable principles of newly discovered truth be considered greater wealth than prizes in gold that perisheth? Moses was a utilitarian after a heavenly type. He had such respect unto the recompense of reward as to esteem even the reproach of the incarnate Truth as of "greater riches than all the treasures of Egypt." Truth is its own reward, and Substantialism its own security. We venture the assertion that these are the sentiments which prompted Dr. Hall to make the offer of the prizes announced in the *Microcosm*. He would have all men come to the knowledge of the truth as held in the Substantial Philosophy. Knowing full well that people can not have the benefit of this system without a thorough study and examination of its merits, he offered these prizes with a view to the stimulation of earnest search. This is the key that unlocks the otherwise unsolved problem of his generosity. His purpose is to incite diligent investigation of the system, which, though it now be reproached by the wisdom of idiots, contains in its own constitution the germ of its own final victory. In the enjoyment of this reasonable assurance he is not alone. He is surrounded with a noble army of witnesses who already foresee the time when Substantialism will build its temples of fame on the earth, and rear their towering steeples to the skies, while the dark domes of false philosophy are tumbling into merited oblivion to lie buried under centuries of accumulated dust.

For these reasons the writer joins the substantial hosts in pressing toward the mark for the prize. With others, he is fully conscious that this age is materialistic in its false view of the nature and design of property, as well as in its false conceptions of the truth. Not even the Church of Christ is free from the terrible contagion. Thousands of congregations have caught this false utilitarian itch, and are now scratching themselves into a country where the remedy is said to be abundant. The leading colleges and universities of the world are operated upon an endowment of money, rather than by an independent spirit of honest inquiry after the truth where-soever found and by whomsoever discovered and taught. Heaven hasten the time when



our colleges shall be endowed with common sense! If one per cent. of the amount of money now piled up in the form of endowments, with the practical effect of throttling independent inquiry and barricading the highway of paradoxical truth, could be placed at the service of the Substantial Philosophy for the purpose of teaching and demonstrating its superiority over moss-covered nonsense, the shadows of mental and moral light would roll away with greater speed before the rising of a light inferior only to the effulgent splendor which the Star of Bethlehem alone can shed.

### CHRISTIAN SUBSTANTIALISM—ANOTHER WORD TO THE CLERGY.

BY THE ASSOCIATE EDITOR.

In view of criticisms called forth by my recent article on the "Importance of Substantialism to Christian Ministers," as printed in the December *Microcosm*, I have been induced to append the following additional considerations and re-inforcements of the general argument. I begin by re-iterating my conviction that every clergyman in this whole land should not only be a substantialist, but that he can not afford to be without the overwhelming advantages which this new departure in scientific and religious philosophy will furnish to his ministry.

Indeed, Christianity itself, when properly understood, unmistakably teaches spiritual Substantialism: "In my Father's house are many mansions," etc. What would a "house" or a "mansion" be, if but a "mode of motion?" "We have a building of God," says the apostle, "an house not made with hands, eternal in the heavens." Of what use would a building or a house be that was not intended as the substantial habitation of substantial beings, and that was constituted of no conceivable substance? And how could God himself as a builder exist if He were not a substantial personal creator? Every creed of almost every church in Christendom teaches that Christ is "of one substance with the Father." How can this be if the Father is not a substantial being? And how can a minister subscribe to this almost universal article of faith and not be a veritable substantialist in the spiritual sense?

Scriptural substantialism consists in the doctrine that our home in heaven is a real, substantial home; that our souls are substantial entities; that our Father and our Savior are substantial persons and of the same substance; and that when our vile bodies "shall be changed and fashioned like unto Christ's glorious body," even these glorified bodies of ours which have put on immortality will still be nothing less than substantial personalities.

Christian Substantialism teaches that there is an "inner man" as really and truly as an "outer man," and that both are equally substantial, though one is material and visible, while the other is immaterial and invisible,—the one ranked among "the things which are seen" which are temporal (material), and the other among "the things which are not seen" which are eternal (immaterial).

Bible Substantialism teaches no such materialistic fallacy as that while the "outer man" is a real substance, the "inner man" is an insubstantial "mode of motion" of our corporeal molecules, and consequently a non-entity. It teaches no such gross Hæckelism as that

while the "natural body" is a real entity, the "spiritual body" consists only of the vibratory motions of our material brain and nerve particles, and therefore that such so called spiritual body, being only molecular motion, must of necessity cease to exist at death when these material molecules come to rest.

The present Substantial Philosophy in a word, is only a natural and legitimate extension of Christian Substantialism into the physical domain, in order to draw upon the forces of the natural realm for incontrovertible proofs such as materialistic scientists would be bound to respect, and thus, by the true analogies of the physical laws, to stop the mouths of gainsayers in their opposition to revealed religion.

Materialists tell us learnedly and confidently that the vital and mental forces which move and control our material bodies are only the complex motions of brain and nerve particles; and then they courageously proceed to corroborate it by the admitted fact, according to all accepted science, that many of the forces of nature which move and control other material bodies are conceded to be but modes of motion of the molecules of those very bodies, or of surrounding bodies, as in the case of sound, heat, light, magnetism, etc., and hence, that these forces are in no sense substantial entities according to the very text-books on which our accepted theories of physical science are based.

This was the impregnable position of German and English materialists as the Substantial Philosophy found them ten years ago, and to which no clergyman on either side of the Atlantic ocean had ventured to formulate any definite reply. When such materialists would sneeringly spurn the plea for religion with their boasted and stereotyped assumption that the vital and mental forces were but the complex motions of brain-molecules, and then prove it to the discomfiture of the religionist by referring him to the analogous forces of sound, light, and heat as but molecular vibrations, the educated clergyman, who had been taught in the current science of the schools, could say absolutely nothing in reply. How could he? In the light of his own scientific theories he was dumb as a sheep before her shearers.

Under such circumstances what else was there to be done to save the cause of religion from the clutches of materialism, except for some reckless scientific iconoclast to throw himself into this breach and thus risk his reputation as a thinker by a bold *coup de maître*, thereby to smash this claimed physical analogy even at the risk of antagonism to many of the accepted theories of science?

We believe we are safe in saying that no Christian scientist of any logical acumen would even now dare to face Prof. Hæckel and assert that our vital, mental or spiritual forces are necessarily anything more than molecular vibrations without first securely arming himself with the Substantial Philosophy. The ablest theologian on earth would be but a pigmy in the hands of that German naturalist should he affirm the current doctrine that sound-force, light-force, and heat-force were but the complex motions of matter, while at the same time trying to prove the soul a substantial entity. Hæckel would laugh at such an inconsistent scientist, and tell him first to get rid of his own "modes of

motion" in physical philosophy, as constituting the natural forces, before trying to rescue religion from the only analogical inference possible if modern science be true, namely, that the vital, mental and spiritual forces which move and direct our bodies, and which constitute the human soul, must likewise be but the complex motions of our material molecules.

No Christian philosopher, we again assert, could even attempt a successful reply to this argument without a radical change of base as regards the scientific teachings of the schools. As certain as that logic and the laws of natural analogy mean anything, he would be obliged first of all to renounce the motion-theories of the text-books on physics, repudiate especially the doctrine of sound, light and heat as modes of motion, and accept unreservedly the teachings of Substantialism,—that every force of nature is necessarily a substantial though immaterial entity,—before he could say one consistent word in reply to Hæckel's analogical arguments.

This general proposition (that every form of physical force is necessarily substantial) being first established and accepted, the previously confounded religionist would at once become a prodigy of argumentative strength, and would find himself abundantly able to turn the analogical tables upon an army of materialists. This principle of natural analogy transferred to the side of religion by aid of Substantialism, would compel the materialist to admit that the mental, vital, and spiritual forms of force, according to the very logic and consistency he had boasted, must likewise be substantial entities; and thus by the very analogies of science, just before positively claimed to favor materialism the Christian minister could fairly and triumphantly substantiate the immortality of the soul. Was ever an argumentative achievement more devoutly to be prized by Christian ministers?

This is exactly what the Substantial Philosophy has so successfully accomplished for the cause of religion in its analogical extremity, struggling as it was in the diabolical grasp of this octopus of German materialism. And it is on account of having done this in his own unceremonious style, that Dr. Wilford Hall is now tabooed by some of the professors of physics in our respectable Christian colleges, as the scientific crank of New York, when, if the truth were known, those very professors who indulge in such contumely, would be only too glad to bear its weak odium could they have been the fortunate discoverers of the laws and principles on which the Substantial Philosophy is founded.

Instead of opposing with obloquy and envious prejudices the man who has thus dared to risk his all to save the cause of religion from the assaults of the infidel hordes, it would rather be the noble thing on the part of these Christian professors to thank God that there was to be discovered a possible way of escape from the atheistic drag-net of natural and scientific analogy so defiantly thrown about the pulpit by Hæckel and his confreres as seriously to menace its destruction.

This analogical argument, however, with its evidence against materialism and its salutary bearing upon the general cause of religion, was so fully set forth in my previous paper, and has been so ably and repeatedly elaborated by the editor of the *Microcosm* and its army of

contributors, that I forbear to extend its discussion further at the present. I beg of the reader carefully to ponder this special aspect of the Substantial Philosophy—a phase which some of the best theological minds of the country are beginning to regard as of such paramount importance, particularly to the clergy, as to make it worthy of all acceptance.

#### THE LESSONS OF THE MAGNET.

BY THE EDITOR.

Since our allusion last month to the new and powerful magnet at 60 cents by mail, we have been kept quite busy filling these orders. Indeed, the importer referred to has been obliged to cable to France for a new and larger invoice of these masterly weapons of the Substantial Philosophy.

Several subscribers who have taken advantage of the offer have urged us to explain in the *Microcosm* briefly the use of this instrument, and thus show how it can be employed advantageously in the pulpit in confirmation of the substantial nature of the soul and in proof of its probable immortality.

We did this in our pamphlet on the "Immortality of the Soul Philosophically Considered," thousands of which were ordered at the commencement of the *Microcosm* seven or eight years ago. A few copies of this work are still on hand at 15 cents by mail.

But we remark in addition to what is there said that the real value of the magnet in Substantialism is in demonstrating the *substantial*, and, at the same time, *immaterial*, nature of force, *per se*, or force of whatever character.

Not only will the magnet lift a piece of iron from a distance bodily without any material connection with it, showing it to be a real substantial agency, but it will lift this iron just as well and at just as great a distance while acting through the most impervious body known, such as a pane of glass, the same exactly as if nothing intervened. Let us relate an incident in our experience to which we alluded in Vol. III., of the *Microcosm*, which will illustrate the lesson of the magnet here stated more fully than any thing else we can say.

An avowed atheist, at Cincinnati, Ohio, a Mr. S—, once agreed to accept the fact of the existence of God if we would demonstrate the existence and moving power of any substance that is absolutely immaterial, or that would act in total defiance of material conditions. A company of intelligent ladies and gentlemen were present.

Fortunately, as was our habit, we had a powerful steel magnet in our pocket. Mrs. S., at our request, produced a large glass plate, into which we threw a dozen needles, and then proceeded to move the magnet back and forth below the plate. To the surprise of the atheist and all present the needles, obedient to the substantial agency acting upon them, followed every movement of the magnet as forcibly as if they had been tied to it by silken threads.

Mr. S. was confounded, but asked, in some confusion, if it was not possible that the magnetic force, instead of being an immaterial substance, might find its way even through the imperceptible pores of the plate? We asked what material substance would satisfy him as being free from pores. He answered *water*.

We accepted his suggestion, filling the plate half-full of water, and floating thereon a large

paper card. On this card we put a paper of needles and then, as before, moved the magnet below the plate. True to the Substantial Philosophy and the nature of force, the immaterial magnetic substance passed unimpeded through the glass and water, seizing the needles as before, and thus steadily towing the card after it by means of its immaterial cords, as a horse would pull a boat upon the canal by means of a material towline.

Still our atheistic friend needed one more test. "May not the magnetism," he asked, "pass around and over the edge of the plate and the water and thus reach the needles without actually passing through glass and water?" We were ready for this difficulty also.

We soon obtained from an adjoining drug store a tall narrow glass bottle, with a ground glass stopper. To the point of this stopper we fastened a thread by means of wax, and at its lower end suspended a dozen needles, nearly touching the bottom of the bottle. Having inserted the stopper, our final demonstration was ready.

Passing the magnet toward the lower part of this vessel, instantly the needles responded, rushing against its side.

"Fill the bottle with water!" shouted the atheist, in excited emotion! It was done; but still not the slightest difference occurred in the response of the needles to the approach of the magnet, except a trifle slower movement in consequence of making their way through the water. The substantial but immaterial magnetic force acted precisely the same under every conceivable condition as if nothing intervened.

The atheist gave it up, with tears in his eyes, and his skeptical friends, who were present, likewise admitted their conviction, not only in the substantial existence of God, but could see no reason why the human soul might not be a real, substantial entity, immaterial in its nature, and a rational subject for personal immortality.

Such is one of the many lessons of the magnet in meeting atheistic and materialistic objections to religion, and such is one of the numberless proofs in physical science on which the principles of the Substantial Philosophy rest. Let clergymen and laymen who may wish to defend the claims of religion against the cavils of scientific materialism, arm themselves with this invincible weapon of the Substantial Philosophy, and the entire cohorts of darkness will be unable to stand before them.

#### DR. SWANDER'S PAPER.

In his very able and racy paper on another page, Dr. Swander gives his reasons for deeming it inadvisable to enter the cash-prize contest as an essayist on Substantialism and Collateral Discussion. In giving these reasons, he lets out a very important court-secret when he intimates that the real object of the editor in offering these prizes was to induce an ambitious and critical reading-up of the principles of Substantialism by the writers of the country. Now, in return for this adroit exposure of our motives, we will also hint that the doctor's real reason for declining to enter the race is that it might be considered unfair to other and younger contestants, he having already written and published a massive volume on the same subject, entitled, the "Substantial Philosophy." Our less experienced contributors will

readily appreciate the suppressed generosity of the learned author in surreptitiously declining to enter our prize-arena, since handicapping in this game of writing essays on Substantialism is practically out of the question. The doctor is a genius, but we see through him, and we will cheerfully let him out of the contest for the benefit of others, if he will only give us an occasional flash of his genuine rhetoric similar to that in the present number.

#### PROGRESS OF ELECTRICAL DISCOVERIES.

BY THE EDITOR.

During the past year (1888) but little, if any, original progress of note has been made in the great field of electrical discovery and invention. It is doubtful if one single patent has been obtained from the United States Patent Office during the year relating to the varied uses and applications of electricity and electromagnetism, except for slight modifications of previous fundamental improvements. Indeed, it is not surprising that this is the fact. It is scarcely conceivable, except by a mighty stretch of the imagination, that each year should bring to light any great fundamental and radical advance, even in such an all-pervading field of possibilities as that of electricity.

Yet, judging from the past, we are not without hope, even against the recorded evidences of the Patent Office, that some of the most startling achievements in that field ever yet made may soon amaze the world of science and philosophy. Let us try for a moment to draw on imagination's resources and see what may not be in store as a reward for the patient explorations of the inventor and discoverer.

Electricity is but one form or manifestation of the universal fountain of natural energy, of which heat, light, magnetism, sound, gravitation and cohesion are others. Hence the air, the earth and the ocean are full of this substantial force-fountain or force-element in its quiescent condition. At present our only means of eliciting this peculiar form of force called electricity for available uses in the mechanic arts is the employment of other modes of mechanical energy, as steam, water-power, heat, or chemical action for its transformation and elimination.

Now, may not the genius of man yet discover means, if not of tapping this reservoir of force, so to speak, as we might tap an exhaustless reservoir of water, at least of so far transforming this fountain of energy directly into electricity as to do away with the cumbersome and expensive dynamo, as the dynamo machine has superseded the more expensive and objectionable liquid batteries?

As new and improved forms of dynamos and new and better arrangements of the eliminating and transforming electro-magnets are being made every year, for disintegrating magnetism and converting it into electricity, may there not be a mighty and astonishing step in advance ready to burst upon the world by which no dynamo or mechanical contrivance whatever will be needed, but by which the simple transformation or conversion of heat into the electric current will supersede dynamos as well as drive all our machinery?

As a concomitant of this stretch of the fancy, might we not also reasonably look for a new and perfect means of storing the elec-



tricity thus eliminated, into condensed receptacles so insulated and guarded by at present unknown composition, that enough of this substantial fluid could be concentrated within a storage-battery the size of a common tender of a locomotive engine, to drive a passenger train of cars from here to Chicago, and thus entirely to do away with steam as a motive power on our railroads?

Such a conception is not at all unreasonable, judging from the marvelous progress that has been made in that direction within the past decade. The world is even now ripe for some astonishing achievements in this very system of storing electricity which may soon startle our men of science.

The surprising fact that electricity can be stored at all and thus be transported for days in a man's satchel to do efficient mechanical work, contains the promise and potency of almost unlimited achievements on that line of research, which, when accomplished, must revolutionize the commercial interests of the Continent.

As a single illustration, the whole water-power of Niagara Falls could be put to the elimination of electricity, even by means of dynamos as at present, to be secured and insulated in suitable storage batteries. These, in turn, could be loaded upon trains of freight cars for transportation to all parts of the United States and Canada, while a single one of these hundreds of reservoirs thus taken on a train would furnish the motive power for its own transportation by driving the locomotive! The same with all the water powers of the world, including the tides and waves of the ocean.

There is no doubt but that the climax of our civilization in the near future will consist largely in the complete mastery of electric production and control, while its perfect insulation and storage in concentrated power for self-transportation may be looked forward to as among the closing physical and mechanical triumphs of the Nineteenth Century.

Then the Electric Telephone also opens up as another field for scientific exploration and improvement, probably not yet one quarter plowed even by the incisive shares of our Bells, Grays and Edisons. Already a score of enterprising telephone companies, temporarily suppressed by the decisions of the courts, are waiting in almost breathless impatience for the expiration of the present controlling Bell patent some four years hence, with a view of thrusting in their perspiring sickles for a share of the golden sheaves which have already added a hundred millions of dollars in pure wheat to the Bell granaries. But how do these organized and hungering companies know but that at this very writing another controlling patent is pending, which, if it should be owned by the Bell Company, will be equivalent to the extension of their monopoly another seventeen years by lifting their present speaking telephone to a plane of efficiency so much above anything at present known as to make the present instrument, even if public property, no competition whatever as against the new improvement?

In brief, so marvelously unsearchable, far-reaching and inexhaustible is this realm of electrical research that the world may always stand on tip-toe ready to be astonished by the next denouement, but never to be disappointed how much soever it may be startled.

P. S.—Since the foregoing was in type, we have learned of the return of Prof. James Ricalton from his year's trip around the world as the agent of Mr. Edison, in search of some substance which the inventor supposes possible to be found that will achieve the final triumph in his mastery over electricity. No one but Edison and his confidential agent knows the special work this supposed substance is to accomplish. We believe we have hit it in the foregoing article, and that Mr. Edison has thus caused the whole earth to be searched for the proper insulating material to perfect the permanent storage of electricity. We hope he has found it. The *New York Sun*, of February 23d, adds:

"The article which Mr. Ricalton set out to find is supposed to be a vegetable or mineral substance possessing peculiar properties necessary for one of Mr. Edison's inventions. The prevalent idea was that Mr. Edison did not know there was such a substance, but he hoped Mr. Ricalton would be able to find it, and the latter, it is supposed, went provided with instruments and carefully prepared instructions to test all substances which he might suspect would fill the bill."

What a thing it is to have the means to carry out one's ideas and conceptions of the possible! There would be many original discoverers and inventors as great, perhaps, as Edison, had providence given them the first fortunate financial turn by which afterward to mould circumstances, as it did in the case of the Wizard of Menlo Park.

#### Meteors and Petrifications. Suggestions on Inquiries,

BY REV. D. OGLESBY.

In 1832 or '33 I saw the most beautiful sight that is possible to be seen in this world. The whole heavenly vault was ablaze with meteors. They flew helter skelter in every direction, as thick as snow flakes.

When a large one would shoot across the sky, it left a long streak of phosphorescent light behind it, as a match does when you strike it on a wall, and before the line would fade out, hundreds of smaller ones would cross the track, and thus the whole heaven was checkered in indescribable beauty.

We lived in timber land. They seemed to go down very often into the timber. Persons who lived in the prairies said that some of the larger ones reached to the ground and burst into fragments. Such was the view from near midnight, until daylight rendered the scene invisible. Occasionally, after broad daylight, a large one could be seen. Meteors are not visible in the higher atmosphere. We were lying down in the day time, when a boy, on the grass in our orchard, looking up at some fleecy patches of clouds floating along, when a meteor plunged right through a small cloud. In a little while the cloud scattered and became invisible. So when we read afterwards in a learned scientific work that meteors were fifteen hundred miles high, we knew that it was a mistake. We have always supposed them to be small fragments of light substance, floating in the expanse above, and when they come in the range of the earth's attraction, the increased velocity causes such heat as they enter the lower and denser strata, that they consume and sometimes, but not always, explode.

Sometimes stones of various sizes come tumbling down with great force. Three or four years ago one fell near here. The writer was lying out on a couch in the warm evening reading a paper, and hearing a sound as of thunder, got up and looked, but no cloud was to be seen. The conclusion was that a mill-boiler had exploded at a little town in that direction. But we ascertained that one man saw the descending object, which must have been a very large one. It fell in a scope of timber and has not been found, so far as we know. Such stones may have floated for untold ages before they lost the poise or balance between the great bodies on every side. Where did they originate? Who can tell? No one. "Secret things belong to the Lord."

Dr. Hall's suggestions in the February *Microcosm* as to the possibility of turning the human body to stone, reminded me of a little experience. In 1843 or '44 I boarded and taught school. In the family where I boarded was a little girl, Harriet Scott. She was uncommonly stout. She was about eight or ten years old. In hay harvest she took sick with fever, and in a few days died. She was buried in a family graveyard. The weather was uncommonly dry and hot. The ground was so hard that it had to be picked and shoveled out like soft stone. The body of the child being fleshy, and the intense heat, would have led any one reasonably to suppose that decomposition would have begun inside of twelve hours; but such was not the case. Eight or ten years after her death, arrangements were made to move the bodies from this graveyard to a public cemetery. When the workers came to lift the body of this little girl, they were astonished at its weight, and on examination found it had turned to stone. Every part of the body was perfect in shape, except those parts that were thinly covered with clothing, or not covered at all. The face and fingers were partly gone, the remaining portions were all perfect. Cutting the substance it seemed to be about the color of chalk and about as hard.

Now the question: Why this freak of nature? Who can tell? The writer has always believed that it was the effect of medicine administered very shortly before death. But unfortunately the doctor who attended the case had died before the discovery of petrification was made. But the same medicine injected in the veins or arteries after death might not permeate every fibre of the body, and therefore might not produce the same effect. Possibly, other means for permeation might be discovered. But after all, Doctor, I for one would demur to such a discovery. Death carries to the family and friends torrents of sorrow. We feel as if we never, no never, could recover from the blow, though time, precious time, silently, gently flows along and washes away the ghastly wound that death has made. The birds sing again, the dewdrops sparkle with all the tints of the rainbow. We forget our sorrow and are happy. To preserve the dead body would be to keep open the wound to bleed on and destroy the life of joy.

There is too much *materialism*, Doctor, in this method. All the immortality which the Egyptians hoped for was in embalming the dead. Hence the rocky bluffs of the Nile for hundreds of years were honey-combed with caves and niches in which to deposit their em-

balmed dead. The poor used salt, the rich costly spices. When the railroads came into use, the dry bodies of the rich were used as fuel with which to generate steam. The bodies of the poor would not burn. So we have Dives and Lazarus on this side of the river Styx. I would say to the chemist, put away your crucibles, retorts and chemicals, and let dust return to dust, uniting with its original elements. This is a very strange world. We read very recently of a wealthy lady who spent hundreds of dollars in the burial of a dog. Some of the tombs of the rich are guarded by the year at great cost by sentinels with musket and bayonet. What folly! What heathenism in a Christian country! As if one little lump of dirt was any better than another! And the money spent in building those receptacles by the rich in which to preserve their worthless "vile bodies" would tint anew the "white lips of famine," dry up a multitude of tears, and be a bank account from which to draw in Heaven and to all eternity; not of "filthy lucre," but of the treasures of happiness and bliss, which moth and rust cannot corrupt, and which thieves cannot break through and steal.

RICHVIEW, ILL.

[The objection of Bro. Oglesby to the petrification of the bodies of our loved ones at death on the ground that it would tend to keep them in perpetual remembrance, applies with equal force to the preservation of their life like photographs and oil portraits, or to the preserving of the busts and statues of our eminent men. Of course, what is wanted in this new art of petrification is such perfection as will leave a life-like and complete form of the body as it was at death transmuted into imperishable stone, with every feature intact. Surely such reminiscences of a departed friend would tend much to obviate the horrors of the mouldering urn, with its devouring worms and corruption of decay. Still, no one would need to seek the aid of a petrifier, who would prefer the forgetfulness of the grave. EDITOR.]

#### A PERSONAL STATEMENT

By the Editor, concerning the "sensational book" on Health and Longevity referred to in the December and January numbers of this volume of the *Microcosm*, will appear next month, making a most important announcement. The world needs the treatment therein described. We conscientiously regard it, as by all odds, the most important scientific discovery of our life. Hundreds of our readers are anxiously impatient about securing its benefits. We are troubled immeasurably concerning these importunities from persons in decline of health whose physical troubles would in our candid judgment be instantly removed by means of the marvelous health-discovery we were so fortunate as to make forty years ago. We must put it into some shape to do its beneficent work without unavoidable delay.

#### ITEMS OF INTEREST FOR SUBSCRIBERS.

1. All new subscribers should remember that the year's subscription commences with the December number, or the first of the volume. The paper for half the year is well worth the subscription price; but we give the whole year, including back numbers, for fifty cents.

2. All subscriptions for foreign countries (except the dominion of Canada) should include twenty-four cents extra for postage, or two cents for each number.

3. Do not forget your friends at a distance, but send us their names on a postal card, so we can send them free sample copies of the *Microcosm*, which we will gladly do.

4. Ministers who think they might be able to raise among their friends a club of twenty subscribers to the *Microcosm*, and will send us the \$10, will receive by express our "Scientific Library" of eight volumes that will live, valued at \$11. See last page.

5. Let our subscribers remember that the average of one single new name from each would at once double our subscription list and make things very comfortable and cheerful at 22 Park Row, New York. We believe there are very few, if any, subscribers on our list who could not, by suitable exertion, induce at least one of his neighbors to take the *Microcosm* for one year on trial. The way to do it is to loan this number, with a request to read it, and then send for another free copy in its stead. Who will try it?

6. Many of our subscribers are urging us to increase the price of the *Microcosm* to \$1 a year, beginning with the next volume, and to double the number of pages, making it a 32-page monthly. With all due respect to these earnest and enthusiastic friends, we say emphatically—No! Nine-tenths of our subscribers find it a subject of hesitation to pay even fifty cents, much as they desire to read the *Microcosm*. While a few might gladly pay \$1, or even more, rather than do without its monthly visits, a vast majority would reluctantly be compelled to discontinue it if the price were raised. Hence, while we live to edit, own and control the *Microcosm*, the price shall not be changed. Remember this.

#### A SOUND INDORSEMENT.

The *Vanceburg (Ky.) Times*, replying to a Theosophical publication from London, disparaging to religion and the church, says:

"It is intimated that the church is giving up its tenets and dogmas and acknowledging the formidableness of science and trying to accommodate its belief to the teachings of Darwin, *et al*; but we think this church-retreating statement is only a 'thrust in the dark,' and that those in the light of the new phases of the sun of science will find that what has been accepted as science and which has stood in opposition to the Christian religion, has been demonstrated a mode-of-motion nonentity, and that true science and the Bible confess and embrace each other. We would recommend the Theosophical Society to subscribe for Dr. Hall's *Microcosm*, 23 Park Row, New York City, U. S. A., and become enlightened in regard to what Christians believe in regard to the dual nature of man and the universe. They will then know the difference between material and immaterial substances, and may be able to form a concept of evolution far different from that which they now entertain. They may be able to see the very border land of the material in the odor of the rose, and the beginning of the immaterial in the electric current. They may be able to understand how God can combine the unseen forces of nature and even perform a 'miracle'"

without interrupting the course of the natural laws of the universe. At any rate they can 'Catch a Tartar' by reading A. Wilford Hall's 'Editorials on Spiritualism,' and may in the end acknowledge that Theistic Evolution was only a pun."

#### A SIGN OF THE TIMES.

The Rev. C. T. Carroll, Presiding Elder in the Holston Conference of the M. E. Church South, at Weaverville, N. C., writes us an encouraging letter about the way Substantialism is getting a foothold in the colleges down there. He sends \$1.50 for three subscribers, two of them professors, and adds:

"You see we are working the *Microcosm* into our college here of more than 100 students. Professor Rheim, one of the above subscribers, is in the science department, and declares that he will not teach the current theories of sound, light and heat without also teaching the principles of Substantialism. The cause of the Substantial Philosophy is growing rapidly among the thinking men of the South.

"Wishing you great success, I am very truly yours,  
C. T. CARROLL.

#### A Sample of Many Other Similar Indorsements.

Rev. Prof. W. H. Pepper, of Milford, Ky., writes: "I have read the 'Problem of Human Life' and been a student of the Substantial Philosophy since the first issue of the *Microcosm*, and I do not hesitate to say that I would rather have the honor of being the founder of Substantialism than to wear the crown of the mightiest potentate who now sits upon an earthly throne. I think I understand the principles of that philosophy, as I have been teaching them to students in my humble way for years past. Those principles have become a part of myself, and involve, as I conceive, such vital truth that I do not know how to separate them from the essential truths of Christianity itself. My aim and desire is to take to the lecture platform and thus make known in the most effective way possible a scientific and philosophical system of doctrine that not only harmonizes with religion, but one that the religious world has been in need of for centuries."

#### A Part of the "Problem of Human Life."

Some ten years ago, when the "Problem of Human Life" was first published in its present form, a portion of it right out of the middle of the book—225 pages—was published separately, and sold at half the price of the complete work, or at \$1 per copy by mail. There were five thousand copies thus printed and bound, nearly all of which have been sold. A few copies still remain for those who wish to do a little active missionary work among their neighbors to put them to thinking upon the inconsistencies of the motion-theories of modern science. Those now remaining on hand will be sent post-paid at 20 cents per copy.

Next month these motion-theories of science will receive one of the most effectual scourings they have ever experienced since the "Problem of Human Life" came from the press. Let advocates of those theories prepare to stand from under.



## THE LIBRARY OF SUBSTANTIALISM.

This library consists of eight volumes, all of which are devoted to the principles of the Substantial Philosophy. These volumes are:

1. The "Problem of Human Life," 524 double column octavo pages bound in cloth, price \$2, by mail. This was our first scientific book, of which between 60,000 and 70,000 copies have been sold without a dollar spent in advertising—simply by one person telling another. The discussions and original principles introduced and unfolded in that volume have led to seven other books, making up this library, as follows:

2. Five volumes of the *Microcosm*, of nearly 400 double-column octavo pages each, bound in cloth, price \$1.50 per volume, or \$7.50 for the set, by mail. These volumes contain the rise, progress and complete elaboration of Substantialism during its stormiest discussions, directly after the circulation of the "Problem" began, and are invaluable to those desiring to obtain a knowledge of that Philosophy in all its details.

3. The *Scientific Arena*, volume I, a large quarto of nearly 200 pages bound in cloth, price \$1 by mail, is a continuance of the discussions, in an advanced form, of the first five volumes of the *Microcosm* named above. The second volume of the *Arena* is not yet printed and bound, but will be after a while, and will then be included in the "Scientific Library," at the addition of \$1. Those desiring it are now sending in their names. As soon as 250 names are received it will go to press.

4. The Text-book on Sound, bound in cloth, price 50 cents, is one of the most important of the entire series of the Eight volumes. It is by the Rev. Dr. J. I. Swander, under our own most careful revision, and no man can read it understandingly without being convinced of the absolute truth of Substantialism.

### Dr. Wilford Hall's Scientific Library.

[From the *Arena*.]

"The principles of the Substantial Philosophy, with their collateral bearings, which are unfolded in Dr. Hall's writings, have cost him more than ten years of unremitting labor, such as few men besides himself have ever performed. The results of this tireless scientific and philosophical research, as therein elaborated and set forth, can be found in no other library of books on earth; and those who fall of the present opportunity to secure these unique works, at the trifling cost proposed by his publishers, will realize a missing link in their chain of knowledge, which they may always regret and may never be able to supply."

### Eight Volumes that Will Live.

"This Library consists of the "Problem of Human Life" (\$2), the five volumes of *THE MICROCOSM*, bound in cloth (\$7.50, or \$1.50 each), the first volume of *THE SCIENTIFIC ARENA*, bound in cloth (\$1), and the "Text-book on Sound" (50c.), amounting in all to \$11.

"By special request of Dr. Hall this entire library will be sent to any person by express on receipt of \$5, if ordered soon, or before the plates shall pass into other hands—an event probably not far distant. If sent by mail the postage, \$1.25, must be added.

"No person who has tasted the fruits of this comforting and elevating system of doctrine, as set forth in those volumes, should allow this opportunity to go by for leaving to his children an heirloom which may prove an almost priceless memento in coming generations. Bear in mind that this library can only be obtained by addressing the Editor of this paper."

### Appleton's Encyclopedia.—A Great Offer.

"We have several sets of "Appleton's Encyclopedia," second hand but in excellent condition (not the illustrated edition, but the one previous), 16 large 800-page volumes, in leather binding \$30; or in cloth \$24. Either set is worth to any student double this amount. Let no man complain after this that he lacks the facilities for obtaining universal knowledge, a thing which is only possible with a good encyclopedia.

Address A. WILFORD HALL,

Editor of the *Microcosm*,

23 Park Row, New York.

### Three Cash Prizes—\$30, \$20 and \$10.

Our contributors, and our literary, scientific and philosophical friends should not forget the opportunity we have presented for earning one of the above-named cash prizes during this volume by sending us an essay on Substantialism or collateral discussions. Remember, these essays must not be more than a single solid page of this paper, in brevier type, 1,200 words. See this announcement as first made in December, or in No. 1. of this volume. A number of writers, as we learn, are preparing themselves by study for this contest.

## What the Press Say.—A Mere Specimen of Hundreds of Unsolicited Notices.

### "A Masterly and Triumphant Refutation."

[From *The Christian News*, Glasgow, Scotland.]

One of the most trenchant and masterly opponents of this theory (Darwinism) is Dr. Wilford Hall, of New York. Some time ago he wrote a book entitled *The Problem of Human Life*, in which he subjects to a searching and critical analysis the strongest arguments in favor of evolution advanced by Darwin, Haeckel, Huxley, and Spencer, the acknowledged ablest exponents and advocates of the system. Never, we venture to say, in the annals of polemics, has there been a more scathing, withering, and masterly refutation, read or printed. Dr. Hall moves like a giant among a race of pigmies, and his crushing exposures of Haeckel, Darwin & Co. are the most sweeping and triumphant we have ever read within the domain of controversy. If our thoughtful and critical readers have not yet read the book, we venture to prophesy that they have a treat before them.

### "The Book of the Age."

[From *The Methodist Protestant*, Baltimore, Md.]

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Press of H. B. ELKINS, 13 and 15 Vandewater Street, New York.

# The Microcosm

A MONTHLY JOURNAL OF SUBSTANTIALISM AND COLLATERAL DISCUSSIONS.

THE ORGAN OF THE SUBSTANTIAL PHILOSOPHY.

**A. WILFORD HALL, Ph. D., LL. D., Editor and Proprietor.**

(Author of the "Problem of Human Life," "Universalism Against Itself," Editor of the *Scientific Arena*, &c., &c.)

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Address all communications to A. WILFORD HALL, 23 Park Row, New York.

Vol. VI.—No. 5.

APRIL, 1889.

50 Cents a Year.

Entered as secondclass matter at the New York Post Office.

## INCONSISTENCIES OF THE MOLECULAR THEORY, No. 2.

BY THE EDITOR.

(Continued from February, page 34.)

The molecular theory further teaches that in compressing a material body such as air, for example, into a smaller volume, we do not condense these molecules and atoms at all, nor in anywise affect their form or volume (as they are wholly incompressible and indivisible), but that we merely force them into nearer proximity one to another, causing them to hit each other harder and oftener in their incessant bombardment, thereby generating more heat, as observed, for example, when air is suddenly compressed, etc., etc.

Now these are very important admissions. Let us look at them for a moment. The theory, observe, is obliged to teach that molecules, or at least the atoms of which they are composed are absolutely incompressible, for if compressible then their shape must change, and the only way the shape of a body can be changed is to displace its particles in relation to each other, thus demonstrating its composite character and its divisibility.

But granting that these ultimate molecules of matter are indivisible and hence incompressible they must be wholly inelastic. Now observe a new and serious difficulty. No two balls can rebound from each other when brought into collision only by their elasticity, and elasticity can only act when compression and indentation occur. Hence, two inelastic incompressible molecules of the same size and velocity brought together in collision from opposite directions would stay together and both lose their motion, as there could be no rebound owing to want of indentation. In such case their motions necessarily would cease.

By the same law each collision of any two incompressible molecules from whatever angle of approach would destroy at least a part of the respective motions of each, till in a very limited time all motions of the mass of molecules must be neutralized by continual contact, whatever original motions these molecules may have had, and however these motions were obtained. Hence, their motions and their bombardments disposed of as aforesaid, what hinders all the molecules of any mass finally from touching each other, by incessant contacts and losses of motion, like a cup

full of shot? Nothing; as it is only their motion and their bombardment, according to the theory, that prevent their permanently resting together in contact.

Then, in that event, a mass of matter of whatever character, with its molecules resting in contact, with their motion gone, and their bombardment ceased, should be absolutely incompressible, and being without elasticity neither heat, light, nor electricity should pass through such body as these forces are only the varied motions of these molecules and the motions of the molecules of inter-molecular ether; while the molecules of ether should be as much resting in contact with entire loss of motion by their collisions as those of a mass of iron,—being equally a material substance.

Then further, it follows that sound should not pass through any body because of such incompressible molecules resting in contact, since sound can only travel, according to the theory, by the "condensations and rarefactions" of the conducting body, etc., etc. A mess of incongruity sure enough. Now all this is a fair statement of this universally taught scientific theory on this subject, and we propose briefly to consider its claims to consistency, as weighed in the balance of reason. Sir Isaac Newton in formulating the theory of sound-velocity, as based on the density and elasticity of our atmosphere, assumed a similar structure to the air; that is, that it was constituted at least in part, of solid particles or wholly incompressible molecules, separated about nine times their diameters apart, and that the spaces between these solid air-particles was filled with something (he does not intimate what) which consumed or took up all the time of the passage of sound in its travel through a given distance of air as "condensations and rarefactions."

Newton tells us that no time at all was taken up in the sound's passage through these solid particles, since they like our more modern molecules, were incompressible.

Here, in passing, one is inclined to ask how sound, constituted of condensations and rarefactions, could pass *instantaneously* through these solid molecules of the air, as Newton claimed, which were without elasticity, being neither susceptible of compression nor rarefaction?

But sound had to pass through them, according to Newton's formula of the wave-theory, and that, too *instantaneously*, or they would have been of no aid in reconciling the discrepancy he met with namely, an actual gain of 174 feet a second in the velocity of

sound over that required by the density and elasticity of the air as compared to actual observation.

Plainly, as "condensations and rarefactions" sound could not go through an incompressible body at all, however small it might be, and Newton ought to have known it; but if these "condensations and rarefactions" had to travel around a solid particle as they came to it, then they would have taken a still longer time to reach a given point than observation justifies, thus increasing the famous discrepancy of 174 feet a second instead of reconciling it!

Thus Newton in formulating the wave-theory and in laying the foundation for the present molecular theory of science, made it absolutely impossible for its shrewdest advocates to show the least consistency in its various formulas and theoretical details, as we shall soon more fully see.

Newton, however, at that time, did not believe in the all pervading *ether* of Huygens and of modern physicists, and consequently in holding that air was constituted of solid particles, separated nine times their diameters apart, he actually supposed these spaces between them to be absolutely vacant, or in other words, to use a sollocism, filled with *nothing*.

On this view how was it possible for these spaces of absolute emptiness to undergo "condensations and rarefactions" by which to convey sound according to the wave-theory which he had so learnedly formulated? And if the solid particles of the air (of which it was constituted) really counted for nothing in the velocity of sound,—passing the wave instantaneously,—then how could such spaces of *nothingness* between these solid particles be formulated from their "*density and elasticity*" by which to predetermine what ought to be the velocity of sound in air thus constituted of solid particles and spaces of absolute nonentity?

Or, if Newton held, as some suppose, that these inter-atmospheric spaces were not an absolute vacuum, but that they were filled with a very much finer grade of air than composed these solid particles, which interstitial air-spaces received all the condensations and rarefactions, then how was it possible for Newton to fix upon a formula for the necessary velocity of sound based on the elasticity and *density* of that finer air when he knew nothing at all about its density or weight as separate from the solid particles, or *so far as related to the only part susceptible of condensation and rarefaction*?

It is rationally supposable that the solid particles of the air were many times heavier than the interstitial spaces, and that they naturally went to make up most of the real density of our atmosphere, so far as any human calculation or measurement was possible. Why, then, did not Newton, when he ran across his celebrated discrepancy of 174 feet a second between the observed velocity of sound and that calculated according to formula, go to work, guess at their weight and then deduct the density of the solid particles from that of the thinner air-spaces, thus changing the relation of the gross density to the gross elasticity of the air, thereby harmonizing the discrepancy? He surely had as much right to do this as to leave the density as it was, including the solid and incompressible particles, which could play no pos-

sible part in the condensations and rarefactions, except to float around and then assume that these same condensations and rarefactions traveled instantaneously through the floating and solid particles which could neither be condensed nor rarefied!

Thus having pointed out a few of the inconsistencies of Newton's introductory view of molecules and the interstitial spaces of thin air or vacuum which they occupy in material bodies, let us now look calmly for a few moments into the so-called "marvelous consistency" of the present improved molecular theory of science.

(To be concluded next month.)

#### PRIZE ESSAY No. 5.

#### Unchanging Forms of Energy.

BY ISAAC HOFFER.

Any action in nature that gives shape and form to matter must be a formative action applied by a formative energy, with all the powers within itself to shape the matter into definite forms. The formative action takes place within the matter to be shaped, and operates from the interior outwards, directly the opposite of man's action in shaping matter into forms. In formative chemical action the minutest particles of matter are made to assume the shape of the crystal to be formed. This action seems to be governed by the material in which the action takes place, for each kind of mineral has its particular form of crystals.

In vital action there must be a transmission from previous life before any action can take place, and while such action will only take place under suitable conditions for the particular kind of life to be developed, the transmitted germ of life is the formative energy that has within itself the power to vitalize and assimilate the right kind of matter, and to shape it into a plant or animal. It is the vital energy in the germ that determines the distinctive form and characteristics of every plant and animal, the matter embodied is characterized and made to conform to the particular life in the germ, thus showing clearly *that life exists only in individual forms of energy*, that it is the developing, characterizing and controlling power in every plant and animal; and that it must therefore be an individuality in its elementary condition, was such in the source from which it came, and can never be any thing else. Elementary material substances can never change in their essence, and elementary energies are governed by the same law. The indestructibility of matter and the conservation of forces, being admitted, life-force can be no exception to this universal and unchanging law of indestructibility.

The vital energy transmitted to a seed, either in plant or animal life, is not a transferring of any part of one life to another. It is the transmission of a new and distinct germ of life, with all the inherent powers to be developed into a complete self-acting and self-subsisting individual form of energy.

This life in the seed can not be seen, felt, or detected chemically, or by any other means known to man, and yet every seed that grows furnishes tangible and positive evidence that the life did exist therein, notwithstanding the impossibility of its detection. Why should



this life-force be less an entity than the plant or animal that it develops?

When the plant or animal is developed in the form and character of the vital energy in the seed, the same life-force sustains and animates this form, and maintains its distinctive character until the dissolution takes place; and when the dissolution takes place, the abnormal form and condition of the matter in the body can no longer be sustained; the form is destroyed, the matter resolved into its normal condition and returned to the earth from whence it came. In the union, matter is the yielding and passive substance, and life-force the substantial and controlling form of energy. After the dissolution the matter remains a passive yielding substance in accordance with its inherent laws, *and there is no reason why the life-force should not, in accordance with its inherent law, remain a substantial form of energy.*

In the human form of energy, there is more than vital action and animal instinct. There is a fully developed intellectual condition, that is not merely a limited, conditioned, and definitely fixed agency, wholly dependent upon conditions that are entirely beyond its control, as life is, but a self-developing, self-exerting, originating, energizing, directing and controlling energy capable of manipulating and utilizing matter and life and the forces of nature. Every mechanical structure, every manufactured article, and every product of man's work, is but a materialized representation of the completed work of intellectual energy; even the process of making a material representation of a mental design must be directed and controlled by this energy; and if these productions of intellectual energy have any real existence, the power that produced them, and upon which their existence depended, should certainly have as clearly and as fully a real existence as the things produced. *The producing and acting cause can not be less an entity than the thing produced.*

The material body returns to the earth, the source from whence it came, and the immaterial form of energy, according to the same law, returns to the source from whence it came. But how, and in what form and condition does this vital intellectual energy—this human soul—return to the source from whence it came? It has never manifested itself in any other shape than that of the human form, and there are no signs or features in the manifestations and laws of nature to indicate that any change in its relation, combination, or environment, would change that form, and it is impossible to conceive and apprehend the human soul in any other than that of the human form; just as it is impossible rationally to conceive that gold in different combinations, shapes, or states would be any thing else but gold.

The soul is a form of energy for the reception of intelligence, and the intelligence received and incorporated constitutes the developed soul. Without the incorporated intelligence the soul would be a dormant form of energy, like the dormant germ in the seed, powerless to act, except to receive and appropriate intelligence, and thereby develop itself into a self-acting, directing and controlling energy as it is in man. This developed and developing soul being unchangeable in its elementary form of energy, must be unchangeable in that which has been incorporated, and become a fixed and constituted part thereof.

It is therefore but a reasonable conclusion, and in full accord with the laws of nature which throw any light on the effect of changes in the relation of matter and life, that the soul in separating from its earthly body will retain its distinctive individual form of energy, in which it had become fixed and established in this world, *and will return to the sphere from whence it came, with its developed and developing intellectual energy unimpaired.*

It is perhaps impossible to demonstrate, so as to be perceptible to the senses, that the human soul can be a living form of intelligent energy separated from the material body; because the senses are not always safe guides in determining positive truths, and because immaterial though substantial forces can not be sensibly perceived by the human mind. The senses tell us that the sun revolves around the earth, but intellectual discernment has proven the reverse to be the truth. It is true that a locomotive is the power that pulls the train of cars, but it is not the whole truth, nor the most important part of it. The actual truth is that steam is the power that moves both the locomotive and the cars, and back of steam the heat; but back of this, is the *whole and absolute* truth that mental force is the efficient cause, and the directing and controlling power in the whole movement, and in all that was necessary to make the movement possible. Water, evaporated by heat, appears to pass out of existence, and yet it is known to be the same in a state of invisible vapor as it is in a lump of ice. In all these cases the *apparent* truth was at fault—either wholly an error, or only partly true.

When these fallible tests are taken into consideration, in connection with the fact that the human mind can not sensibly perceive immaterial forces, and can only perceive the effect of their action on material substances, it can readily be seen how unreliable and misleading appearances are, and how inefficient sense-perception is in determining scientific truths and rational facts. No test by the senses can discover any form of a chicken, or of a force and design to build one, in a fresh-laid hen's egg, and yet such a force is there, that will transform the substance of the egg into a living chicken. If life-force thus defies detection in visible matter, *is there any reasonable ground for the supposition that it could be detected when it passes out of the material body and is separated from it?*

The rational and logical conclusion would be, that as vital and mental force can only be apprehended by the effect of their action, they can not be detected when their action ceases; and it would be as illogical and as unscientific to conclude that when this force ceases to act it ceases to exist, as it would be to hold, that when a piece of ice is dissolved and transformed into invisible vapor, or a piece of wood is apparently consumed out of existence by fire, the imperceptible parts must have passed out of existence.

Apparent truths may be actual delusions, and partial truths are often the source of totally erroneous conclusion, as the instances mentioned fully illustrate. It is therefore important that intellectual discernment, after careful research, should corroborate apparent facts before they are accepted as established truths.

It is a scientifically established truth that vital action does not take place unless there

has been a transmission of a vital germ from previous life, and that this germ, and not the matter of the seed in which it is contained, is the positive acting power in any vital action that may take place. The apparent and partial truth that life exists only in a material body, and that this body is the essential and only thing of life that sense-perception can apprehend, does not in the least affect the fundamental truth that vital energy is the source of vital action, the positive power that forms the material body, and the active agent that sustains it during life.

It is an undisputed fact that mental energy is the source, and the energizing, directing, and controlling power in all man's doings; and if the self-evident law of action, *that a controlling power can not be less a reality than the thing controlled*, can be relied on, then the apparent fact, that mental energy is the dependent effect of the material organism, is clearly deceptive, and in direct conflict with the admitted fact, and an axiomatic law.

Therefore, unless the laws of nature change from what they now are, or the progress of scientific knowledge develops new facts to show that the vital-intellectual energy of man has no positive existence, or is in its elementary condition not an individual form of energy, the law of stability (unchangeableness) in elementary substances and energies, and the indestructibility of matter and force, fully sustain the position that the intelligent life of man — *that which constitutes man* — is *unchangeable and indestructible*.

Lebanon, Pa.

#### PROJECTION AND GRAVITY.

[We here give the first of three short papers from the pen of Dr. Roberts, which are full of thought. They were inspired by an article by Reuben Hawkins on the same subject printed in the second number (January) of this volume, which should be studied in connection to get their full benefit. At the close of Dr. Roberts' third article in the June *Microcosm* we will present a brief editorial unfolding some new laws and principles involved in the complex problems of the interaction of projectile and gravital force, not touched upon by either writer, and so far as we know, never before considered by a writer on physics. The *Microcosm* is nothing unless it can continually bring out of its treasury things new as well as old.—EDITOR.]

#### FORCE AND MOTION No. 1.

REV. J. W. ROBERTS, F. S. Sc.

In Parker's "Compendium of Natural and Experimental Philosophy," at page 89, under the division of "Compound Motion," it is said: "When a body is struck by two equal forces in opposite directions, it will remain at rest. A body struck by two forces in different directions, will move in a line between them." Illustrations are then given to show that when a body is struck by two equal forces at right angles, it will be moved in the diagonal of the square. All standard works on Natural Philosophy, as now taught in our schools of all grades, teach the same thing. It is a natural and inevitable outgrowth of the mode of motion theory which now prevails. That it is absolutely erroneous is clearly demonstrable.

The error is radical. It consists in the assumption that motion is force, or its equivalent, and that *where there is no motion produced there is either no force, or force is at zero*. This is fundamental error. To illustrate: We know that two equal forces striking a body at the same time in opposite directions produce no motion in the body. But suppose that one of these forces applied to the same body unopposed will move it 50 degrees, then, of course, both of them applied jointly in the same direction will move the body 100 degrees, *with exactly the same expenditure of force which produced no motion when applied in opposite directions*. What then? Plainly this. That the two forces when operating in opposite directions produce an expenditure of force not resulting in zero, but in 100 degrees below zero. In other words, the forces which produce no motion whatever are exactly equal to the forces which produce 100 degrees of motion. The same amount of force is the same, no difference what the result of its application.

Example: Take two hammers, one in each hand, and bring them together on a ball of lead suspended by a thread, with all the force of muscular effort possible, and the ball will be flattened into a sheet of lead. Then strike a ball of the same size with one of the hammers, and it will go whirling through space with great rapidity. In the first place no motion was produced in the ball, in the other there was. If two forces are strong enough, and employ steel blocks through which to be expended, and are brought together in opposite directions upon a ball of iron, the iron will be flattened into a sheet or slab, or be ground to powder; but no motion other than this will result. The premises in the text-books being wrong, all the conclusions drawn therefrom will also be wrong, and instruction on this line is misleading throughout.

Instruction on the mode of motion theory, places zero of force where there is zero of motion; but, as just shown, it is not zero of force, but 100 degrees below or more than zero. Where, then, will zero of motion be in unison with force? *Where these two equal forces come together at right angles*. Instead of diagonal motion equal to the diagonal distance of the square being the result, there will be no motion at all; for the two forces exactly balance each other, and there coalesce in equilibrium. The point at which the combined action of both forces will equal the single action of one of the forces is exactly half way between right angles and a straight line.

The same law holds good in the expenditure of unequal forces. When applied at right angles the result will be that which would be produced by the greater force alone, *less the loss of power in overcoming the lesser force*. This is too obvious to require further elucidation. From the foregoing plain and lucid propositions we obtain the following axiomatic truth:

*Motion is never force, but always and inevitably the result of force applied to a material body. As a result of this fundamental truth is this analogous fact. Momentum is the result of multiplied motion, and motion is multiplied by the multiplication of the force which produces it upon and within the body moved. Or, briefly: The multiplication of force upon itself in the body moved produces momentum. Motion is always an effect, never a cause in itself.*

Oskaloosa, Kansas.

PRIZE ESSAY No. 6.  
Immaterial Substance.

BY REV. JOHN CRAWFORD, D. D.

I have been astonished to find so many who object to the expression "*immaterial substance*," asserting that it is a contradiction in terms. I shall, in this article, endeavor to remove their imaginary difficulties; and vindicate the use of the terms in question.

That persons utterly unacquainted with philosophical matters should find a difficulty here I am not surprised. The late Dr. Chalmers relates an anecdote of a Highland minister, who preached three sermons to prove the immateriality of the soul; and, for this, was cited before his presbytery, on the charge of having tried to prove that it was immaterial whether or not we had souls. These plain people thought that, if the soul was immaterial, it must be nothing!

But, for any one possessing the slightest tincture of philosophical culture to see the least difficulty in conceiving of an immaterial substance can only be accounted for by the malign influence of the *materialistic* teaching of the day.

The soul of man is certainly not matter. All philosophers, even Hæckel and his followers, admit this. But, if not material, what is it? Is it a real thing, an entity? All theologians worthy of the name, and most philosophers admit that the soul is a reality. Such men, I admit, as are atheistical, as Prof. Hæckel, deny the soul to be an entity. With them it is either an attribute, or quality of the material brain, or the motion of its molecules. If this be so, man is irresponsible, and "death must end all."

It is to be hoped, however, that few are prepared to embrace this atheistic view; which, if legitimately carried out, must regard God himself as no more than the motion of the physical laws and material particles of the universe.

But, if we refuse to adopt these skeptical views and deny that the soul of man is but a mere attribute, or the motion of the material brain; or that God is no more than the movement of the physical laws, have we any other alternative but to admit that both God and the soul of man have a real existence?

This being admitted, our next enquiry is, are they, or are they not material substances? There are few, indeed, even among mere scientists, who regard either God or the soul of man as composed of *material* substance. Both lack the three essential attributes of matter, gravity, inertia and impenetrability. It is amusing, if it were not humiliating, to read, in our text-books, such experiments as the following: "Carefully weigh a 'ball of iron,' then heat it to a white heat, and weigh it again. It has gained nothing in weight by the heat which it contains. Therefore, heat is no more than the motion of the molecules of the iron." Now is not this mere child's play? If heat is an *immaterial* entity, it can have no weight. If there be any truth in this experimental proof, we might proceed, in the same manner, to prove that the soul of man is also a nonentity, and that Hæckel, after all, is right in teaching that it is a mere motion of the material brain particles. Weigh a man. He is just 175 pounds. Kill him by a spark of electricity, and weigh him again. Lo! he weighs precisely the same as before, just 175

pounds. The presence of the soul in the body adds nothing to its weight. Therefore, the soul must be a nonentity; and Prof. Hæckel is right. It is the mere movement of the living brain, etc. Is not this as good logic as that founded on the experiment of the heated iron ball? This sort of proof is childish in the extreme! Any professor using it ought to be made thoroughly ashamed by making him acquainted with Substantialism.

If the soul be not matter, as most will admit, it can have no weight; for no immaterial entity can have weight. Were heat material, it would undoubtedly cause the iron ball to weigh more.

Again, if the soul be material, it must be *inert*, for inertia is an essential attribute of matter. But we know that the soul is not inert; and, therefore, can not be matter, just as its lack of gravity also proves it not to be material. The same argument will apply to the Creator. Were he material, as some fanatics suppose, he must also be inert; whereas he is the source of all activity and power, "the living God."

Again, were the soul of man material, it must be also *impenetrable*. That is, it could not occupy the same space, at the same moment of time, as any other material substance; but we know that the soul occupies the same space as the material body; therefore, it must be immaterial. The same is true of the Great Spirit, in whose image we have been created. God fills the entire universe, both that which is material and that which is vacant, for he is omnipresent. I think, from what has been said, it will be conceded that both the spirit of man and the Infinite Spirit are entities, not mere attributes, for they themselves possess attributes; and not mere motions, for they both possess self-moving power, as well as the power to move other bodies. Now does it follow from this that God and the souls of men are the only immaterial entities in the universe? Are not angels ministering *spirits*? and spirits are certainly immaterial. This our Lord taught most distinctly, when proving the reality of his resurrection. "Handle me, and see; for a spirit hath not flesh and bones, as ye see me have." It was his material, tangible body that was raised from the grave. Again, are not Satan and his angels fallen spirits? Are they not immaterial entities?

What are we to say of the spirits that animate the brute creation? Surely no one will contend, after what has been said, that these are material substances, or mere motions of the brute brain! The spirits of man and of brutes are self-acting or moving, and, therefore, both are immaterial. They both weave, out of inert matter, material organisms, as a covering for themselves, and use them as their organs. As we have seen, matter is essentially inert; and, therefore, could not fashion itself into an organism, or in any way change its form. If this be true of the matter that composes the bodies both of man and beast, is it not also true of the material vegetable organism? It also is inert. Chemism, one form of the force-element of nature, allied to cohesion, is an immaterial entity and might work a chemical change in vegetable matter; but could not construct an organism of any kind. There must be in the vegetable, as well as in the animal kingdom, an immaterial, vital organ-



ism, which constructs the material organism after its own pattern, and often, in its operations, counteracts, by a higher force, the working of chemical laws. But on this interesting topic I must not enlarge in this article.

Now, if we have seen that, in all the departments of living beings, from the Creator down to the meanest worm, and even to the moss and the lichen, there are innumerable immaterial entities, why may there not be immaterial entities also in other departments of creation? What is there of absurdity in regarding all forms of the force-element of nature, such as heat, electricity, light, magnetism, gravitation and sound, as also immaterial entities? I think, in a former article, I proved that they are certainly entities. But they have not one of the essential attributes of matter, inertia, weight or impenetrability. Nor are they mere nonentities, for they possess qualities, or attributes. They, in fact, can be nothing but immaterial entities.

This conducts me to my last step in this argument. Are they immaterial *substances*? What else can they be? If the soul of man is an entity, as most will admit, if it be also immaterial, as is commonly admitted, what objection then can there be to calling it an immaterial *substance*? Can any thing be an entity which is not a substance? Can any thing possess attributes which is not a substance? It must be either a material or immaterial *substance*. Johnson gives, as the meaning of *substance*, "something existing, something of which we can say it exists." Now does not the soul exist, although immaterial? Is it not, therefore, an immaterial substance? Is not God also, for the same reason, an immaterial substance? So also the spirits of brutes! Now, why, in the name of common sense, do we refuse the use of the term substance to these different forms of the force-element of nature, as heat, light, magnetism, etc. If we have proved them to be immaterial entities, they may also and properly be called immaterial *substances*, for every thing which exists and sustains attributes, must be a substance.

St. Thomas, Dak.

#### PROF. STEVENS' LECTURE.

BY THE EDITOR.

We have recently enjoyed a scientific treat, not so much from the value of the information we received, as from an exhibition of a most desperate effort on the part of one of the leading professors of physics in this country to justify and defend the wave-theory of sound in opposition, to the Substantial theory. Prof. W. L. Stevens is the professor of physics in the Packard Inst., of Brooklyn, N. Y., and stands on a par with Prof. Mayer and Prof. Tyndall as one of the leading physicists of the world.

Some months ago it was given out in special cards that this renowned advocate of the wave-theory of sound would deliver a lecture before the New York Academy of Sciences at Columbia College on the "Diffraction of Sound" which phenomenon it was assumed could only be accounted for on the wave-hypothesis.

At the invitation of Dr. Henry A. Mott, a member of that society, we accompanied him to the lecture on the evening of President Harrison's inauguration. As expected, the

lecturer used the high-sounding title of his proposed address—"The Diffraction of Sound"—as an opportunity for defending the wave-theory generally, and for ridiculing in a sarcastic but very weak manner what he termed the new fangled and ridiculous theory that sound was a Substantial force, or in other words an "immaterial substance."

The provocation to this ridicule was, as he admitted, the lecture of Dr. Mott delivered before the same society some three years ago, against the wave-theory of sound at which Prof. Stevens was present. It has, as it seems, taken the professor all this time to recover from the shock he received from Dr. Mott's substantial battery, before daring to stand up in the presence of the same audience and essay to defend the old theory so badly crippled on that memorable occasion.

During his introductory remarks, and while indulging in many sneers at Dr. Mott for his opposition to the well-established doctrine of acoustics as taught in the schools, he repeated several times that it was impossible for him to conceive of such a thing as an "immaterial substance!" That it is a "flat contradiction in terms;" "for how," he reiterated, "can any thing be *substantial* that is not *material*?" etc.

Now we feel sorry that the education of this eminent professor in matters of common-sense, science and philosophy, has been so egregiously neglected in his youth, as utterly to paralyze his intellectual capacity for sound reasoning in his maturer years. That a young student or beginner in science should thus have been puzzled, especially at the first presentation of the proposition, would not be so surprising; but for a mature philosophical investigator, capable of filling the chair of physics in any respectable college in America, not to be able to see that substances may be immaterial as well as material, presents a marvel of stupidity, not to say puerility, that can only be accounted for by a strange freak of intellectual abnormality.

Is it possible that Prof. Stevens never saw a magnet held an inch or more above a piece of iron and lift it against the force of gravity? Is it an absurdity for him to suppose that this magnetic force, which thus reaches out from the magnet, seizes the iron, and lifts it bodily, is a *substance* of some kind,—an *objective entity*? Is he so innocent of all logical comprehension of the relation of things,—of the relation that must exist between cause and effect,—as not to know intuitively that this magnetic force which performs the physical task of lifting this bar of iron must be a substantial entity?

But supposing him to have sufficient intelligence to comprehend this elementary fact,—that there must be a substance of some kind that takes hold of and lifts the piece of iron to the magnet, yet that in his childish conception of things, he can not grasp the idea of its *immateriality*. Then, we ask, is it conceivable that a professor of such varied experience as he must have had, has never thought of testing its materiality by placing an impervious sheet of glass between the magnet and the iron and then observing that this same substantial magnetism will pass through the glass, seize the iron as before, and lift it with precisely the same force and from the same distance as when the glass was absent?

Can he be so dull of comprehension as to suppose that any material substance can pass

through this glass and lift that iron bar? Plainly our unsophisticated professor from Brooklyn, ought to drop over to the *Microcosm* office and take a half-hour's lesson on the nature of force, before attempting to display his ignorance of physical science in another lecture before a learned society. If he will do so, he will learn to his great mental improvement, that magnetism, as a specimen of the natural forces, is an immaterial substance, because, in some of its phenomena, it acts in defiance of material conditions, as in this illustration of passing unimpeded through the most impervious material substances.

With this single lesson impressed on his mind as we will endeavor to impress it, he will never again reiterate before an intelligent audience till he is red in the face with earnest asseveration, that "it is impossible for me to conceive of such a self-contradiction in terms, as an immaterial substance."

From this introduction the professor passed on to give a historical synopsis of the wave-theory and how it came to be formulated. He told his audience that it was Sir Isaac Newton who first demonstrated and formulated the theory from mathematical and mechanical data. That he was the first to determine what the velocity of sound, as consisting of air-waves or atmospheric "condensations and rarefactions," should be by an accurate estimate of the density and elasticity of the air. Still our professor was obliged to admit that after all this calculation and formularization by Newton, he himself overturned his own mathematical formula, and found by experiment that sound actually traveled 174 feet a second too fast for the density and elasticity of the wave-theory! Yes, to the amusement of all present, the professor, in trying to explain how scientifically accurate and reliable the theory is as wave-motion based on the data of the density and elasticity of the air, actually made the self-stultifying confession that when tested it fell short of observation by one-sixth of its velocity, or 174 feet a second!

He then proceeded to give a most humiliating account of Newton's mental floundering in his endeavor to find some way of accounting for this marked discrepancy,—a scientific condition of things which the reader will see graphically illustrated in our opening article of this number.

But Prof. Stevens had to confess that Newton was not equal to this prodigious task, and added, that the solution of the difficulty was reserved for Laplace, the eminent French astronomer, who finally settled the trouble by supposing that the condensation of a sound-wave generates heat in that portion of the air,—that this heat increases the elasticity of the air, thereby causing the sound pulse to act quicker and thus to increase sound-velocity over that of the normal density as formulated by Newton.

But what is remarkably suspicious in this achievement of Laplace is, that he figured out exactly enough heat, and added exactly enough augmented elasticity to the air by this generated heat, to balance the missing link of the 174 feet a second as found by Newton,—no difference whether the sound has the weak condensations as produced by a mosquito's wing with its corresponding infinitesimal heat, or whether the waves were the prodigious compressions of the report of a Krupp gun with its

corresponding heat-intensity. Nor did Prof. Stevens attempt to explain why the generated heat in the "condensation did not exactly balance the reduction of heat in the "rarefaction," thus producing no effect whatever on the general velocity of a given sound.

The truth is, he knew better than to undertake these worse than Newtonian difficulties. Nor did our innocent professor think to refer to the little problem of the mechanical energy it would require for our famous locust to be heard as it frequently is a mile or more in all directions, and thus to convert four cubic miles of air into condensations and rarefactions." Perhaps it never occurred to our professor that this insignificant insect, according to his theory, heats and cools this entire mass of air 440 times a second by its mechanical labor, and thus by pure mechanical compression augments the elasticity of the entire mass sufficient to add 174 feet a second to the velocity of its sound!

No, no; Prof. Stevens knew better than to explain to his audience that this insect, as we showed last month (page 50), would have to perform enough mechanical labor and exert enough dynamic energy in generating this amount of heat by compression, to do the work of a million locomotive engines in pulling trains on an up grade; and what is more, we proved our figures correctly by the testimony of Prof. Mayer himself, as quoted from his authoritative article on sound, as published in Appleton's Encyclopædia.

Either Prof. Stevens is too big a coward to read these arguments after we take the trouble to send the papers to him marked, or too shallow an investigation to see their force, or else he is too prejudiced a scientist, to put it mildly, to come out like a man and confess the truth to the world, after he knows it, namely, that this single argument of the stridulating locust has crushed the very life out of the wave-theory.

His next effort was to throw on a screen from his magic lantern various pictures of supposed sound-waves and thus to show how the air-particles are affected by the condensations and rarefactions of the air according to the wave-theory. And in this part of the exhibition, as we will briefly show, occurs the most self-contradictory state of supposed facts ever perhaps exhibited in a scientific lecture.

He showed that the air-particle hit by a vibrating string or prong was driven into contact with the particles next adjacent, these in turn against the next, not only forward but side-wise, up, down, diagonal, and even backward, in every direction from the central source of the vibration. In this way his screen diagrams showed a shell of condensation, followed by a shell of rarefaction half a wave-length apart, thus these shells followed each other as long as the string continued to vibrate, the foremost shells expanding into larger and larger hollow-spheres, as the others followed, etc.

Of course all this is strictly in accordance with the current theory as laid down in the books. But here the professor could not forbear adding the so-called law of "interference," so manifest in real wave-motion, as, for example, on the surface of water.

He went on to show that two systems of these air-waves, from two vibrating strings placed half a wave-length apart, could so travel together that the shells of rarefaction from one instrument would fall into the condensed

shells from the other, thus producing interference when total silence would be the result—neither instrument being heard at all.

Now, marvelous as it must seem to the average substantialist, Prof. Stevens was actually led into this ridiculous and often-exploded sonorous chestnut, with the same unsophistication as if there were a grain of truth in the pretended law of sound-wave interference as laid down in the books.

We need not make a long reply to this stereotyped part of the average sound-lecture. We have a single point to present which will forever annihilate that claimed law, and which is so self-evident that even Prof. Stevens ought to be able to comprehend it, superficial as he seems to be. It is this: The string advances and sends off a condensed shell which expands in all direction according to the theory. But now remember, at this very instant of advance, *the other side of the string is retreating, thereby producing a rarefied shell, which expands in like manner and exactly at the same velocity!*

Thus every motion of the string, either forward or backward, produces at the very same instant of time on its opposite sides both a condensed and a rarefied shell of air, according to this luminous theory, both of which go off together and travel in absolute interference, thus neutralizing each other, causing quiescence of the air, and consequently total silence, if there be one grain of truth in the theory.

Hence, it follows, that no vibrating instrument has any right to sound at all, simply because every condensation produced from one side of it must be accompanied by a rarefaction from the other side and at the same instant, which necessarily must travel together, thus destroying all sound by interference, if the wave-theory be true.

If Prof. Stevens will answer this one argument against the wave-theory of sound we agree publicly to renounce Substantialism, and Dr. Mott will do the same. Surely this is a fair proposition.

(To be continued.)

#### PRIZE ESSAY No. 7.

**From Whence Does the Sun Derive Its Heat?**

BY MRS. M. S. ORGAN, M. D.

This is a problem which the recognized science of the world has not been able to solve. The latest theory advanced, is, that showers of meteors continually fall into the sun, and the arrest of their motion generates heat, and thus the requisite supply is furnished.

This would make the supply of heat-force, which is constantly demanded in the economy of nature, dependent upon contingency; a condition, which is contrary to all demonstrated law in the material universe. In nature's grand workshop, there is a perpetual influx of substantial force, through which she carries out her eternal designs. She is never necessitated to slack her machinery and await a fortuitous shower of meteors, or for anything else "to turn up," in order to dove-tail the laws of the universe and preserve harmony.

The assumption, that heat is generated by the arrest of motion, has not one scintilla of fact upon which to rest. Motion is a mere nonentity,—a term expressive of the changes of position in space of material bodies.

No one will claim that motion is substance;

and how can the arrest of anything that is not substance generate heat? Can any effect or phenomenon in nature be produced except by actual contact of two or more substances?

Motion not being a force, but always the effect of it, its arrest can not generate heat; for it is only the forces of nature that are convertible.

When a body in motion is arrested by a resisting body, the heat that is developed, is simply the transmuted projectile force, which was stored up in it by the motor-power that set it in motion.

But the question to be considered, is, does the sun send actual heat rays? Such is, and ever has been, the accepted belief in the scientific world. But do the facts in nature substantiate it? Evidently not. As we ascend from the earth, the heat tends gradually to diminish, until the atmosphere falls far below zero; and even in the warm zones of earth, we find the tops of mountains wrapped in perpetual snow. Such conditions could not exist if the sun's rays are essentially hot. In fact, if the rays of the sun are definite heat, the upper strata of the atmosphere ought to be hotter than at the earth's surface, as they receive the first impact, and must of necessity abstract a definite amount of heat.

Each physical force has its own peculiar law of conduction or dissemination. Heat is the democratic force of the universe; it permeates all substance; and does not, like electricity or sound, depend absolutely upon a material medium for conduction, for it will radiate in a vacuum analogous to the rays of magnetism. That the sun sends out a substantial force which is heat-producing, is unquestionably true; but that this force is in the definite form of heat, is disproved by the facts already adduced.

One of the best established laws of science, is, that all the different forms of force are correlated and convertible, and that certain exciting conditions, or motor-powers will, from the universal fountain of undefined force, call definite forms into action; friction, for instance, will generate heat and convert different forms of force into heat; not only friction of matter with matter, but of immaterial substance with material.

When the immaterial rays of the sun strike the earth's atmosphere, the friction produced converts them into heat, and the denser the atmosphere, the greater the friction and consequent heat. The upper regions of air being so rarefied, can cause but little friction, and but a modicum of heat will be developed.

Geological science shows, that during the carboniferous age, the earth's atmosphere was exceedingly dense, and correspondingly hot and moist; and vitality utilized these super-abundant substances in the formation of those gigantic forests which succeeding changes of the earth transformed into coal-deposits. In the combination of force to produce that peculiar mold of matter which is combustible, heat is absolutely essential, but it is vital force which controls and directs the structural arrangement, which harnesses down the physical forces and transmutes them into the forms which the ultimate purpose demands. Then by the application of heat or other motor-powers these forces are again transformed into heat. This is one of the many facts which demonstrate the ceaseless round of activity in the transmutation and conser-



vation of nature's varied forms of force, and it also demonstrates that the theory of latent heat is without foundation.

But so far as the sun's supply of heat-producing force is concerned, it is immaterial whether that determinate form be heat, electricity, magnetism, or any other of the known forms of physical force; the essential fact remains the same, that this supply must come from the primordial fountain which fills all space and permeates all matter. From this universal storehouse of substantial energy, every body in the vast solar system must draw the supply which its economy demands. According to the peculiarity of the exciting conditions, will be the definite form into which the crude or elemental force will be developed. Then after any form of force has subserved the special purpose for which it was called into action, it falls back into the great conservatory of force, surrenders its individuality, and there remains, as elemental force, until some dynamic power again develops it into the same, or other definite form, to serve in the grand purposes of nature. And so the ceaseless round of activity—the supply and demand the liberation, transmutation, and absorption of force continues throughout the countless cycles of time.

#### A Personal Statement Concerning the New Hygienic Treatment.

Last month we intimated in a brief paragraph that we would print in the present number, a "personal statement" in regard to our book on "health and longevity" foreshadowed in the December and January numbers of the *Microcosm*, present volume. We now undertake, with the indulgence of our readers, to perform that difficult and embarrassing task as best we can.

And first let us say that we are influenced to this statement, and to the immediate action herein determined on, because of the general anxiety of our readers to learn more concerning the hygienic treatment to which allusion was made in this journal.

In fact, ever since the December number was issued, not a mail has reached this office that did not contain one or more letters importuning us for the details of the treatment referred to—many of these writers, in behalf of afflicted relatives and friends, offering any reasonable price for the information desired.

So continuously and persistently have these appeals been made that on reading them over we have scores of times regretted seriously that any allusion to the discovery had ever been made in the *Microcosm*, owing to our total inability to comply with the wishes of these afflicted friends.

The sadness of these regrets have been greatly enhanced by the aggravating fact of our own disappointment in money matters,—the receipts for the *Microcosm* not having reached the surplus requisite to meeting the cost of publishing the book as expected,—till we are now forced to confess that we see little or no prospects of being able to spare the means for publishing the work in any reasonable time to meet the emergency of the numerous appeals that have thus been made.

We say here frankly to our readers, that no more money has been received for this paper, even including the sales of our books, than is necessary to insure the success of the *Micro-*

*cosm*; and we resolved at the start that nothing must interfere with the permanent stability of this journal.

We have the manuscript of the book written and ready for the compositor, and we were strongly in hopes that before this time means sufficient would have accumulated to allow the work to go forward. But as this is now clearly impossible, we have asked ourself the question if there is not a better way to proceed, both for our own interests and for those of the afflicted, including the interests of the *Microcosm* and of the cause of Substantialism, than to give this important hygienic discovery to the world in the shape of a published book?

In the first place, the cost of such a book in a safely small edition, including composition and electrotype plates, would have reached not less than \$1200 to \$1500, making the selling price of the work by mail, not less than three or four dollars per copy, in order to allow a reasonable compensation for the risk of the original investment, and a fair remuneration for the intrinsic value of the discovery to those requiring it. For, surely, a hygienic discovery that will infallibly save a person from all doctor-bills and the purchase of all medicines for life, as will this, ought, as a money investment alone, to be cheap at the cost of a dozen duodecimo volumes of the highest price in the market.

In addition to the facts here given, new developments have recently been made in our investigations by which we now see it possible to explain the discovery in its essential details and practical application within a very small compass, as we did not previously feel warranted in undertaking.

The change of plan now contemplated, of condensing the essential details of the discovery and directions for its application, into a private pamphlet for the eye alone of such persons as may desire to possess it, will involve to us but a small fraction of the cost of the volume as originally intended. This saving in original outlay, while furnishing the essential benefits of the treatment to those desiring it, will leave a proportionately larger compensation to the discoverer and to the cause to which it is to be devoted, while other portions of the book, not condensed within the pamphlet named, can be printed in the *Microcosm* from month to month for the physiological and anatomical instruction of all its readers.

Such a change of programme, instead of waiting for means to print the book, would have the advantage of putting the secret of the discovery, with all its health-restoring and health-protecting benefits, at once into the hands of the very persons interested—such parties being required, on purchasing the knowledge of the treatment, first to sign a pledge of honor not to divulge the discovery except as specified in the bond of agreement; while the cost of such purchase would not exceed that of the book itself had it been published as contemplated.

This plan of selling the knowledge of the discovery, may appear somewhat mercenary to the friends of the editor, but it surely is no more so than to have sold the book at a remunerative profit. If the reader will reflect for one moment he will see that this secret of health and longevity, which has cost the discoverer forty years of careful study and experimentation, and which, as he solemnly be-

lieves, is destined in the near future to save millions of dollars to the afflicted of humanity, is morally and justly as much his individual and personal property as is any United States patent he ever owned, or as is the acquired knowledge and skill of the physician, who for a little medicine and a few visits will charge the patient twenty-five or fifty dollars without being considered at all exorbitant in his charges.

Besides this, one other consideration must not be lost sight of by the friends of the editor, namely, that every penny of the price to be received for this discovery is to be devoted by him conscientiously and sacredly to the cause of Substantialism. Indeed, he now looks upon this turn in the case, instead of publishing the book and losing the secret of the discovery without fair compensation, as a providential interposition that may help him to the means for circulating the *Microcosm* as he otherwise would never, perhaps, have been able to do.

Thus, every friend of this work who shall purchase the discovery in question, will have the satisfaction of feeling that he not only owns a "priceless treasure of knowledge" (as the only two "M. D.'s in the secret boldly declare it to be), but that every dollar he has thus spent will do efficient missionary work in extending the knowledge of the Substantial Philosophy. Whatever, therefore, shall be the financial outcome of this venture, one thing is certain, that the discoverer of this treatment will not be one penny the richer, except in good works, as it will all go as fast as received into this cause which is richer by far, and more precious in his eyes, than would be all the diamonds of Golconda.

To patent the discovery, as some have suggested, even were such a thing possible, would be to proclaim it to the world with all its details in the specifications; while to have printed it in a published volume, as we now see it, would have done the same thing,—securing to ourself only a meager profit on a few expensive books, while taking the risk of a large cash outlay in order to do it.

Hence, we conclude that our only protection in the cash value of this, the most important discovery of our life, as we solemnly aver it to be before God and man, is the plan here mapped out for preserving the secret in our own right and selling it to those requiring it under inviolate pledges of honor not to reveal it.

This hygienic treatment applied in pursuance of this discovery, has not only saved the writer from consumption and a complication of physical ailments, restoring him to robust health at the time of its discovery and first adoption forty years ago, but it has saved his health from breaking under a shattered constitution and thus preserved his life on hundreds of separate occasions when exposed to colds and to all the hardships of a roving and adventuresome life on the open plains and amidst the snows of the Rocky Mountains, long before civilization had reached them.

Not only has he proved the absolute health-preserving and health-restoring value of this treatment in his own person during the forty years past, with his left lung lacerated by disease and almost destroyed, but he has made it known to several personal friends on different occasions, who in like manner have proved its disease-mastering and health-protecting mer-

its, and that, too, without medicine of any kind.

As already stated in the December *Microcosm*, the discoverer communicated this secret to his personal friend, R. F. Stevens, M. D., of Syracuse, N. Y., more than twenty years ago, during which time that thoroughly accomplished physician has not only used the treatment upon himself regularly, but upon numerous patients, thereby demonstrating beyond the possibility of doubt the inestimable value of the discovery as thus subjected to every physiological and anatomical test within his knowledge.

The writer has also, within the last two or three months, permitted an eminent practising physician of Columbus, Ohio,—Jesse Huestis, M. D.,—to try the treatment on a near and dear relative who was passing rapidly into a decline, and whose life was in serious jeopardy. This permission was given partly on account of the urgent appeals of the doctor for aid in the case of a very precious and valuable life, but especially to test the treatment once more before offering it to the afflicted, in the hands and under the manipulation of another educated "M. D." of extensive knowledge and therapeutic experience. This doctor writes, not only indorsing the treatment in theory as a marvelous scientific discovery, while accompanying his indorsement with a correct and most critical analysis of its rationale; but he is enthusiastic over the practical benefits that have already accrued from its application to the rapidly improving health of the friend for whose life he had solicited the secret.

Suffice it to say, that the doctor, on witnessing these marked results of the treatment, was anxious to pay any reasonable sum in money as a small token of his grateful appreciation of the favor that had been extended to him, which offer was as generously declined by Dr. Stevens, who had given him the information by our permit.

Let it be distinctly and forever understood that this is no scheme of quackery to draw money out of the afflicted, nor is it any sort of a patent medicine humbug, *since there is not a grain of medicine of any kind required in the treatment.* Notwithstanding this fact, it takes directly hold of the worst cases of constipation, dyspepsia, liver complaints, headaches, heart-disease, incipient consumption, diabetes, and Bright's disease of the kidneys, including fevers and inflammation of the lungs and of other internal organs,—not by attacking these so-called diseases directly, but by radically neutralizing and removing their causes, *thus allowing nature herself to do her work unimpeded.*

This is wherein the secret and the great value of the new discovery consists, namely, in an original and most efficient process of getting at the root of all diseases, by *removing impurities from the blood and from the other circulatory vital fluids of the body*, thus removing the efficient cause of nearly all the organic disorders and physical irregularities flesh is heir to.\* This the new treatment pre-

\*The author of this new hygienic treatment has made the additional discovery, and is prepared to demonstrate in direct opposition to all anatomical and physiological authorities, that there is another system of vital circulation as distinct and elaborate as that of the arterial and venal systems, and as important to the life of organic beings, though it is beyond the reach of the most powerful microscopes. This discovery will be set forth in the portions of his book to be published.

emptorily instigates by forcing a healthy and rejuvenating process of nutrimentation, including a normal assimilation of food, but above all by exciting a rapid elimination and uninterrupted excretion of all deleterious substances unduly retained in the circulation, such as effete matter absorbed from the abdominal viscera, as also worn out and decayed tissues of the organism clogged in the system by deranged processes of alimentation which this new treatment so infallibly rectifies, without medicine and without the slightest restrictions on diet.

In thus elaborating the claims of the treatment, falling, as this preliminary personal statement will, into the hands of many educated medical practitioners, we are aware that we subject ourself to most unfavorable suspicions of being actuated by mercenary motives in setting forth a false and impossible claim of hygienic and physiological merit to our discovery. But we are compelled to take these chances or never make the discovery known to the slightest benefit of the afflicted or the least advantage to the cause for which this journal stands as the organ.

To our old readers, who have followed our discussions and investigations for these ten or twelve years past, we need to make no asseverations of candor or protestations of honesty as to our convictions concerning the great value of the treatment under consideration. We can only say here that the discoverer of this treatment has been too long before the public as the relentless exposé of frauds and humbugs in science to afford to associate his name, at this late day in his life, with any scheme or process affecting health and longevity which he does not conscientiously believe to be a blessing both to the afflicted and to those in health.

In conclusion, we say to the reader that the confidential pamphlet, setting forth the details of the discovery with full directions for its application, including the rationale of its beneficial effects upon health and longevity, will be ready by the time this number of the *Microcosm* gets well into circulation. The pledge of secrecy is now ready, and will be sent free to all who may wish to see it, whether they may ever desire to purchase the knowledge of the discovery or not.

EDITOR.

P. S.—Next month we shall commence publishing installments from the book by printing the *Preface* complete, which will present the general aim and character of the work, to be followed by the *Introduction*, etc.

#### The Great Problem of Living Frogs in Solid Rock.

BY JOSEPH D. MORGAN.

Mr. Editor: I see in the March *Microcosm* what seems to be a genuine live frog puzzle. In 1847, I think it was, whilst the workmen were quarrying stone to wall a cellar, they found a live frog, the cavity in which the frog was found was about the size and shape of a goose egg. The frog lived some minutes after it was taken out, but I think that it was less than an hour. Now, that was at the time, and is still, an unsolvable problem to those who had the privilege of seeing it.

Another case on the old state road known as the St. Louis and Vincennes road, there was a collection of sand and small pebbles formed,

which seemed to have a peculiar tenacity for each other's company, and they were soon joined together by something or other, somewhat resembling bitumen, or pitch. I remember quite well, when the collection of particles of sand and pebbles was not larger than a man's head, and also when it had by this collection, assumed a size much larger than a flour barrel. It being along the roadside it became necessary to remove the same; in doing which it had to be broken in pieces, and near the center of this mass, was found a "live toad." Now this toad had not been entombed I am certain more than twenty years, and perhaps not so long. But what kept it alive?

It is a well known fact, that stone is porous, it is also moist. It is true that the porosity of the sandstone is greater than that of flint, limestone, or gypsum, but still the latter, has to our mind, sufficient avenues of this kind, to furnish all the air that is necessary to sustain the life of the frog in its tiny home. And as the stone is thus receiving nourishment from the outer world, it furnishes air and food for the toad in its comatose state; as it is beyond question in such a state, during its confinement in the rock. And its sudden exposure to the air is no doubt the cause of its sudden death. It is evident that the frog is in a dormant state, the same or pretty much the same, as in its burrow during the long hibernation of a cold winter; as also the case with snakes. This is also the only physiological conclusion that I can draw from the premises. I do not pretend to affirm this position, but this is the conclusion that I have been compelled to reach with what little light I have gathered, and if I am not right, I do hope that the founder of the "SUBSTANTIAL PHILOSOPHY" will set me right, or find some one to do so. And if the science of Substantialism fails to furnish a solution, then to my mind the toad would have been better off to remain in the stone till doomsday.

Odin, Ill.

#### AN ATTEMPT TO SOLVE THE FROG QUESTION.

BY REV. JOHN CRAWFORD, D. D.

The question before us, as proposed by the editor, is, How are we to account for live frogs being found embedded in solid rock, such as coal, gypsum, etc.?

The common teaching in geology is that the materials of stratified rocks were deposited, by a slow process, from previously existent rocks, disintegrated by frost, moisture, heat, etc., and carried to the ocean by rivers and land floods, and deposited slowly upon the sea bottom from its impregnated waters. Also, that coals are a vegetable product, the growth of thousands of years.

Now, if this be correct, it appears to me to be absolutely impossible to account for living frogs being found embedded in such formations! The frogs, in this case, must have died, and decayed, with the vegetable materials of the coal, and during the slow depositing of the gypsum, or other sedimentary rock, in which they are found!

Now, on the contrary, I am prepared to prove, although this is not the place for such proofs, that coal is *purely a mineral substance*, thrown up from the bowels of the earth, and not at all vegetable, although fossil vegetation may be entangled in it, as in other stratified rocks. I



am also prepared to prove that the great bulk of the other stratified rocks were also formed from mineral substances, thrown up from the bowels of the earth into the ancient ocean, existing from the third day of Creation until the flood of Noah, and embedding such marine fossils as are found in them. Hence the superior land animals are not found in stratified rocks proper; but in such surface rocks only as have been formed at the time, and since, the flood of Noah.

Now, if my views be correct, I think the frog question may be solved in the following manner:

When the coal, gypsum, or other rock material, was thrown up, in a semi-liquid and plastic condition, it might embed the living frog. This mineral matrix would effectually prevent evaporation, so that the substance of the frog would continue unconsumed for ages. Moreover, the frog, being a cold-blooded animal, would require no consuming of carbon by the oxygen of the atmosphere, to keep up animal heat.

Again, the frog is an animal capable of continuing long in a dormant condition, although in life. I have seen frogs, buried in mud for a whole winter, in a torpid state, coming into an active living condition at the approach of spring. Now, why might not this dormant and winter condition be prolonged for centuries while the rock was hardening, until, by accident, the animal should be brought to the genial heat of the sun and the operation of the atmosphere? It seems to me that no more would be necessary, in order to preserve the frog in torpid or dormant life, than a sudden and complete embedding in some plastic material, which would effectually prevent evaporation, and at such a low temperature as not to interrupt its dormant condition, or promote decomposition. An egg, I am persuaded, would, under similar circumstances, preserve the life germ uninjured for centuries, and, afterwards, become a bird, if properly hatched and reared in the nest of a fowl of similar species. So the seeds of various plants, as I have witnessed, have germinated, after lying dormant, perhaps, since the flood of Noah, many feet below the surface of the earth.

St. Thomas, Dakota.

#### A REMARK ON LIVE FROGS IN SOLID ROCKS.

BY REV. A. E. PALMER, D. D.

Noticing in the last *Microcosm* your remarks about "*Live Frogs Taken From Solid Rocks*," I send you the following statement which can be substantiated if need be under oath, as the parties are still living. "The late Cassius M. Palmer, Esq., of North Stonington, New London County, Conn., in opening a hill through eighteen feet of gravel and clay, came to a ledge which he blasted to the depth of twelve feet more before he found water. Here embedded, in the solid ledge, he found a live toad, greatly flattened, but which immediately began to breathe rapidly, and presently to hop about and *wink* like any modern toad. He was put into a box for safe keeping, but through an unnoticed hole, made his escape. Who can explain this? This toad must have been entombed millions of years." Can science throw any light upon this? The vital organism intact through all these ages, and at the first touch of the life-giving atmosphere revitalized.

Many cases of this kind have been reported from time to time, but as the "*International Cyclopaedia*" says, they have not been supported by sufficient proof to entitle them to scientific investigation. But this case is as certain as testimony can make it. The farm in question joins the homestead where I was born, and the facts were given to me by my own brother. I have fragments of the ledge also.

Stonington, Conn.

#### THE LIVE FROG QUESTION SETTLED. THE WHOLE MYSTERY KNOCKED OUT.

BY WM. CAIRNE.

Dear Dr. Hall:

On reading in the *Microcosm* about your live frog difficulty, I thought best to drop you a line and let your readers know how it is done. I happen to know something that can be relied on in relation to this problem that has so puzzled many people besides the editor of the *Microcosm*. I have been a miner for more than thirty years, but I never saw, nor have I ever seen, or known, or heard reliably of any person who ever saw a live or dead frog or toad taken from original ledges of solid rock, coal, or gypsum. Here is what I have seen:

Some nine years ago I settled on a homestead in Western Kansas, and built me a stable on a side hill. The layer of rock was a blue soapstone. I dug the foundation at odd spells, sometimes missing days at a time. These delays gave toads a chance to creep into these heaps of soapstone. Some three years after I had occasion to move these heaps of rubbish, and after they were nearly all removed, I heard a squeaking sound, and on close examination discovered a live toad, and soon found ten others.

There they were inclosed in hard lumps of this mineral, in little nests just big enough to hold them. Each toad was in a separate hole, and they were all alive, and on letting them out they hopped away like other toads.

Now here is the secret: I have found by observation that toads and frogs have a curious instinct. That is, they seem to know that they can only preserve themselves in moist or airtight places, and that the more firmly these substances inclose them the better they are protected. I have oftentimes found them preparing just such abodes for winter quarters. I have seen them digging into stiff moist soapstone as hard as gypsum and some kinds of coal, till they would get deep enough to cover their bodies out of sight. Then they would dig on and turn round depositing the fragments thus released from the surrounding wall into the mouth of the hole to become solid and dry, thus securing complete protection from outside enemies.

Now all this I have seen, and I know that this is the way all the toads and frogs said to have been found in solid rock got there, and that any such rock was not so solid but an able bodied toad could dig him a nest into it, and thus cover himself out of sight over Sunday, while the miners were enjoying a rest. But to the eye of the inexperienced it would be an easy exaggeration to make, without intending fiction, that these frogs or toads were exhumed from the primeval and previously undisturbed ledge.

Indeed, had I not known the tricks and habits of these animals, I would have made affidavit that these toads had been ensconced in these

original ledges since Adam was a year old. But I know better. As these animals will live on air and moisture alone for years, they can easily deceive the oldest philosopher in the country by the solid appearance of their excavated nests, which are so porous, especially at the place where the creatures entered (toward which their noses always point), as to afford them this very thin means of subsistence.

Mr. Editor, let me say to your readers that they can make a great deal of allowance when they read of these strange finds by miners, of living frogs embedded in primeval ledges. There is no truth in such stories.

Scranton, Kansas.

#### HOW TO STAY THE TORRENT OF MATERIALISM:

Why Substantialism is a Necessity.

BY THE EDITOR.

For many years we have been urging upon the clergy, who seem slow in comprehending and accepting the principles of Substantialism, to justify this backwardness by offering any sort of reply, outside of this philosophy, to the materialistic objections of Prof. Hæckel against the immortality of the soul. It is almost needless to say that such appeals, to many of these ministers of religion, have seemed to fall unheeded upon their ears.

In spite of the two logical and most convincing papers of the associate editor printed in the present volume of the *Microcosm*, showing the absolute necessity of the Substantial Philosophy as a vindication of religion against the claims of materialistic science, still we are receiving letters from educated ministers, insisting that they can see no relation between the scientific and philosophical defense of religion against infidelity, and the motion-theories of science as taught in the colleges. They do not see, as they insist, what the wave-theory of sound, the theory of heat as a mode of motion, or the undulatory theory of light has to do with the natural evidences in favor of religion and the immortality of man.

We must say that we sincerely sympathize with the self-contented obliviousness of these clergymen, except, perhaps, on the averment of the poet that

*"Where ignorance is bliss 'tis folly to be wise."*

From this ethical point of view they may stand in no need of sympathy as they are contentedly happy. Be this as it may, we shall once more venture to make it clear to all such as have ears to hear and eyes to see, that without the aid furnished by Substantialism every clergyman in Christendom, be he Protestant or Catholic, is helplessly at the mercy of Prof. Hæckel or one of his intelligent disciples, so far as any analogical vindication or reinforcement of the claims of religion is concerned outside of the two lids of the Bible.

Concisely presented, the objections of Prof. Hæckel to all religion, and to any foundation for a hope of immortality, are about as follows: If the physical forces, such as heat, light, sound, magnetism, electricity, etc., are but modes of motion of material particles, as the religious colleges of the world inculcate, then why in all reason and consistency should not mind-force, life-force, and soul-force also consist of various modes of motion of the material brain and nerve particles? How, asks this shrewd materialist, can one class of

the natural forces consist of the motions of matter "and nothing else," as all modern science teaches, and another class, producing analogous phenomena, be substantial entities capable of a conscious and personal existence separate from material conditions?

According to all logic and reason, insists Prof. Hæckel in reply to Joseph Cook, if you admit, as you do, that sound-force, heat-force and light-force can produce all their wonderful effects as motions of matter and nothing else, then I have only to extend your reasoning to mind-force, life-force and spirit-force and thus, by natural analogy and sound inductive logic, as well as by the highest authorities of the schools, wipe out these latter forces as real entities capable of a future substantial existence.

Further, continues the irrepressible German materialist in his annihilating logic, if these forces of nature such as heat, light, and sound, necessarily cease to exist as mere motion, as soon as the vibrating ether-particles and air-particles cease to move, which all science concedes, then manifestly, soul-force, life-force and mind force, consisting of the analogous motions of brain and nerve particles, must likewise cease to exist at death or as soon as these material substances cease to vibrate. Thus do I demonstrate, continues Prof. Hæckel, by your own scientific definition of natural force as "motion and nothing else," that all force of whatever character, must necessarily and logically cease to exist when the vibrating matter of whose motion it is constituted, comes to rest, and consequently that *death ends all!*

Joseph Cook, great and profound reasoner that he is, was helpless in the presence of this overwhelming argument in favor of materialism, believing, as he had avowed and as he was taught to believe in the college where he was graduated, that heat-force was but a mode of motion, that light-force was but the undulatory motion of material-ether, and that sound-force was but the to-and-fro vibration of air-particles.

It needs no open confession on the part of that master logician of the Boston lecture platform, to tell us how he must have been impressed by the crushing proof from his own premises, that if modern science be true, then life, soul and spirit are but modes of motion of organic matter, which will necessarily cease to exist at death when the vibrating brain and throbbing nerves become quiescent.

That this eminent metaphysician, when he first read the logical reply put into the mouth of the German atheist, must have spent sleepless nights in contemplating its direful effects upon current Christian Philosophy, there can be very little doubt. Yet even when the Substantial Philosophy, with its flash-light of invincible facts, had swept this blasting materialistic logic out of existence, and even after its conclusive analysis of the physical forces as substantial entities had opened up a broad highway for his escape from the clutches of his German antagonist, it is sorrowful to relate that he reluctantly and almost silently, as we are informed, acknowledged its force.

Why this hesitancy on the part of the man above all others in America most in need of Substantialism as an impregnable breastwork to fortify himself in his public assaults upon German materialism? Why does he still stand reluctantly aloof from proclaiming this new

philosophy from the housetops of Boston, while many of his brethren in the ministry of all denominations, are receiving its analogical proofs of immortality with greetings of joy and praise? Is it possible that an explanation of this apparent indifference is to be found, as a letter before us asserts, in our comments on "Theistic Evolution" in the Introduction to the "Problem of Human Life?" We will not consent to believe it without further evidence.

But we have digressed in this reference to Mr. Cook, barely to refer to a matter which has troubled the minds of several of our correspondents. We now repeat, with all the emphasis that our language can express, that no one has pretended to give a practical answer to Hæckel's doctrine of the wave-theory of soul and of God as a universal mode of motion as based on the motion-theories of the physical forces, save the answer which Substantialism alone presents, namely, that all the forces of nature, including heat, light and sound, are necessarily substantial but immaterial entities, and, hence, that no force, *per se*, whether it relate to the physical, vital, mental, or spiritual realm, can be a mode of motion.

Substantialism was the first system of doctrine ever propounded which logically and definitely met materialism on its own chosen ground and successfully answered its arguments against religion. Substantialism did this by abruptly wrenching the analogical premises from the grasp of materialistic science.

When we first saw the motion-theory of soul, life, mind and spirit presented by Prof. Hæckel in his "History of Creation," we were startled with alarm for the cause of religion, and for any rational or scientific basis of hope in a hereafter for humanity.

We saw in an instant that if the motion-theories of physical science be true as laid down in all the text-books, and as taught in all the colleges of the land, then good-bye to all natural analogy in support of Christian Philosophy.

A dark shadow fell across our vision, as we saw in this single assumption of soul, as a mode of motion, a flood-tide of materialistic logic, like a devastating cataclysm, backed by every text-book and every college in the world, sweeping down upon the church as if to shatter its very foundation and crush the theological seminary into ruins. We saw in this analogical argument the utter helplessness of religionists in such an unequal combat, especially while the foes of Christianity were constantly supplied with weapons, impossible to resist, from out the armories of Christian colleges, in the shape of ready-made motion-theories of all the physical forces.

What were we to do under these circumstances? First of all we did what logic and reason compelled us to do, and what, as it seems, no theologian had ever before ventured to do, namely, we admitted that, accepting the motion-theories of the physical forces as correct, then Hæckel was clearly master of the situation, and religious philosophers, whatever their ability or achievements, were helplessly at his mercy.

For days after making this discovery our mind, like Noah's dove, had no rest for the soles of its feet. At last, at the hour of midnight, the solution of the nightly problem came in the further discovery that every force or phenomena-producing cause in nature, even including sound the most conspicuous of all,

must necessarily and unavoidably be a substantial though immaterial entity in order to be the cause of any effect whatever; and, hence, if all physical force could thus be proved to be substantial, it would amount to an absolute analogical demonstration of the substantial nature of the vital, mental and spiritual forces in man, and thus furnish a rational confirmation of the cardinal doctrine of Christianity, setting forth a substantial spiritual realm for the substantial soul of man after death.

It was there and then that Substantialism was born, and from that midnight hour dates the beginning of our struggle for a scientific, philosophical and substantial spiritual existence hereafter.

A Swedenborgian minister writes us that Emanuel Swedenborg was undoubtedly a Substantialist, because he taught distinctly that every human being, besides a material body, has within him and of the same form a spiritual body that will survive after the earthly body returns to dust.

This is all true and all very well on the part of the great Swedish seer; but all he thus taught about a spiritual body inclosed within a natural body is but a very small fraction of the Substantial Philosophy in its now invincible march through the physical, vital, mental and spiritual realms of nature.

The substantial phases of Swedenborg's teaching, confined as they are to the spiritual body of man, and to the substantial environments of our future home in heaven, scarcely afford an introduction to Substantialism as a system of scientific principles which forms the indissoluble marriage-bond that has finally brought together and permanently united nature and religion.

Swedenborg had formed but a very vague conception of the vast range of the substantial entities of the universe, and even his philosophical views of spiritual entities here, and of substantial objects in his dream-land excursions to other worlds, were expressed in phraseology entirely unfitted for a scientific philosophy, however well adapted they may have been to a religious society of thinkers who were capable of accepting his visions as true.

He not only thus dealt in spiritual revelations and imagery, but at times wrote upon scientific subjects, it is true, with considerable ability, but in this department of his investigations he scarcely departed from the beaten track of already established theoretical science in vogue at his time.

He taught the wave-theory of sound as true, as well as the motion-theories of light and heat as far as they were then developed. His revelations and spiritual visions never carried him a foot from the beaten track of these false and self-contradictory views of the forces of the natural realm.

He never once touched upon such an essential phase of scientific thought as that all the physical forces were necessarily substantial entities instead of modes of motion, nor did he even conceive of such an all-sweeping classification of the objective things of the universe as *material* and *immaterial* substances.

His discussions involved the weak and imperfect antithetical contrast of *natural* and *spiritual* things alone, and he never once conceived the idea that there was a mighty realm of entities in the universe that lies entirely



separate from both material and spiritual substances,—namely, the *immaterial physical forces*. This revelation was reserved for Substantialism.

Had Swedenborg been attacked by a modern materialist, in a manner as Hæckel assailed the vulnerable scientific positions of present religious philosophers, his mouth would instantly have been shut, with all his spiritual revelations to aid him, as completely as is that of any professor in our theological seminaries, when the disciples of Hæckel defiantly proclaim "soul as but a mode of motion." No man can stand before this resistless logic, based upon the present motion-theories of physical science, but a well posted Substantialist. It is here where Substantialism now steps to the front as both the defender of religious philosophy, and as the invincible protector of the church against the avalanche of infidel logic that must otherwise sweep everything before it.

In view of this state of things, the new philosophy ten years ago saw no other possible remedy for this tidal wave of materialism save to commence a general and promiscuous attack upon these misleading doctrines of the physical forces,—these superficial motion-theories of science,—as taught in all the schools, and which were fast leading the most intelligent of the clergy imperceptibly into materialistic darkness.

This motion philosophy of the physical forces was not only robbing the older ministry of all analogical weapons for combatting the infidelity and atheism which is stalking abroad at noonday, but its worst effects were in poisoning the minds of thousands of young students annually, who were preparing to take the pulpit, and thus, instead of independent philosophical thinkers, fitting them as innocent lambs for the devouring wolves of German materialism. Such is the work that is now going forward in every class-room in this land where young men are being educated for the ministry. And for the crime of lifting up our voice against such perversion of the physical laws, such misinterpretation of nature, and such indifference to scientific truth, we are now receiving the sneers of many religious professors, as well as of Christian journals, whose editors ought to know better.

Why this perversity, so uncalled-for and so unnatural? "Am I your enemy because I tell you the truth?" If the Master was treated outrageously more than 1800 years ago, surely we ought not to expect entire immunity from unreasonable men, even in this more advanced age of civilization.

As an illustration of the prevailing spirit of the bigoted press, the following is clipped from the *Texas Christian Advocate*,—a highly pretentious religious journal,—as a specimen of the unreasoning prejudice of those editors who have little brains to spare from their superficial routine of using the scissors:

"SUBSTANTIALISM" is the name proposed for a new philosophy, or rather a *resuscitation of what was held long ago*. According to this new (?) theory the soul is said to be "substantial" but immaterial. Since the soul is granted to be immaterial, why not use the Bible term spirit. Was anybody ever fool enough to believe that spirit means nonentity? That it is not a real existence? Substantial or no substantial, the soul is neither matter, nor sound, nor heat, nor electricity, but spirit. We suggest as a fit synonym of "substantial philosophy," substantial bosh!

What a profound and astounding thinker must be this Jas. Campbell, editor of the *Texas*

*Christian Advocate*! Poor ignoramus; "he is to be pitied," as a score or more of his subscribers express it in sending us this senseless little fulmination of his spleen and ignorance. This copy of the *Microcosm* marked, may tend to enlighten him, unless his highly diluted immaterial soul is too diminutive to focus its rays.

#### THE "SUBSTANTIAL PHILOSOPHY."

Dr. Swander writes me that the orders are still coming in for his book, of the above title. This will be interesting news, especially to the editor of the *Microcosm*, as the 18th day of August is approaching. (See Jan. No., page 26.) Dr. Swander says that every order he receives is accompanied by a letter of appreciation very flattering to the founder of Substantialism. He has forwarded several of them for examination worthy to be framed and preserved. Let no one miss this opportunity who intends ever to complete his library of Substantialism by the addition of this valuable book of reference, for in doing it now it will essentially increase the 70th Birthday memento of our Editor. Send \$1.50 to the author and publisher, Dr. J. I. Swander, D.D., Fremont, Ohio, and receive the book by mail.

ROBERT ROGERS,  
Associate Editor.

#### Indorsement by Dr. Stevens.

The following, concerning the new Hygienic Treatment referred to in our "Personal Statement," present *Microcosm*, is from a letter of Dr. Stevens to a friend in this city:

"Nearly twenty years ago in this city (Syracuse, N. Y.), Dr. A. Wilford Hall gave me privately a detailed history of a hygienic treatment he had discovered and adopted some twenty years before, and which he had practised continuously upon himself up to that time. This history included an account of the failure of his health, the reasonings and conclusions which led him to adopt the treatment, his rapid restoration to health, etc. From the time of his first mention of it to me I have been entirely satisfied that it saved him from a lingering consumption and death; and that in the years following, as I have evidence to satisfy me, its continued practise has so effected the nutrient and eliminating functions as to give to his physical structure a greater degree of solidity, or in other words, a higher specific gravity than that possessed by any other man living. I learn that he has persistently continued the treatment to the present time—forty years in all—and that his present health and vigorous condition may rightfully be compared to the 'bloom of youth,' though he is nearly seventy years of age. The tests I have made of the treatment upon myself and in my practice in the twenty years past, have convinced me that great practical benefit may be derived by members of the medical profession and others from a careful study of the rationale of the treatment as discovered by Dr. Hall, the details of which he proposes to give in his forthcoming book. A debt of gratitude will surely be due him for whatever scientific advances he may be able to unfold in the line of assisting nature to ward off disease, and in the restoration of health.

R. F. STEVENS, M. D."

#### ITEMS OF INTEREST FOR SUBSCRIBERS.

1. All new subscribers should remember that the year's subscription commences with the December number, or the first of the volume. The paper for half the year is well worth the subscription price; but we give the whole year, including back numbers, for fifty cents.
2. All subscriptions for foreign countries (except the dominion of Canada) should include twenty-four cents extra for postage, or two cents for each number.
3. Do not forget your friends at a distance, but send us their names on a postal card, so we can send them free sample copies of the *Microcosm*, which we will gladly do.
4. Ministers who think they might be able to raise among their friends a club of twenty subscribers to the *Microcosm*, and will send us the \$10, will receive by express our "Scientific Library" of eight volumes that will live, valued at \$11. See last page.

## THE LIBRARY OF SUBSTANTIALISM.

This library consists of eight volumes, all of which are devoted to the principles of the Substantial Philosophy. These volumes are:

1. The "Problem of Human Life," 524 double column octavo pages bound in cloth, price \$2, by mail. This was our first scientific book, of which between 60,000 and 70,000 copies have been sold without a dollar spent in advertising—simply by one person telling another. The discussions and original principles introduced and unfolded in that volume have led to seven other books, making up this library, as follows:

2. Five volumes of the *Microcosm*, of nearly 400 double-column octavo pages each, bound in cloth, price \$1.50 per volume, or \$7.50 for the set, by mail. These volumes contain the rise, progress and complete elaboration of Substantialism during its stormiest discussions, directly after the circulation of the "Problem" began, and are invaluable to those desiring to obtain a knowledge of that Philosophy in all its details.

3. The *Scientific Arena*, volume I, a large quarto of nearly 200 pages bound in cloth, price \$1 by mail, is a continuance of the discussions, in an advanced form, of the first five volumes of the *Microcosm* named above. The second volume of the *Arena* is not yet printed and bound, but will be after a while, and will then be included in the "Scientific Library," at the addition of \$1. Those desiring it are now sending in their names. As soon as 250 names are received it will go to press.

4. The Text-book on Sound, bound in cloth, price 50 cents, is one of the most important of the entire series of the Eight volumes. It is by the Rev. Dr. J. I. Swander, under our own most careful revision, and no man can read it understandingly without being convinced of the absolute truth of Substantialism.

### Dr. Wilford Hall's Scientific Library.

[From the *Arena*.]

"The principles of the Substantial Philosophy, with their collateral bearings, which are unfolded in Dr. Hall's writings, have cost him more than ten years of unremitting labor, such as few men besides himself have ever performed. The results of this tireless scientific and philosophical research, as therein elaborated and set forth, can be found in no other library of books on earth; and those who fall of the present opportunity to secure these unique works, at the trifling cost proposed by his publishers, will realize a missing link in their chain of knowledge, which they may always regret and may never be able to supply."

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"By special request of Dr. Hall this entire library will be sent to any person by express on receipt of \$5, if ordered soon, or before the plates shall pass into other hands—an event probably not far distant. If sent by mail the postage, \$1.25, must be added.

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"We have several sets of 'Appleton's Encyclopedia,' second hand but in excellent condition (not the illustrated edition, but the one previous), 16 large 800-page volumes, in leather binding \$30; or in cloth \$24. Either set is worth to any student double this amount. Let no man complain after this that he lacks the facilities for obtaining universal knowledge, a thing which is only possible with a good encyclopedia.

Address A. WILFORD HALL,

Editor of the *Microcosm*,

33 Park Row, New York.

### Three Cash Prizes—\$30, \$20 and \$10.

Our contributors, and our literary, scientific and philosophical friends should not forget the opportunity we have presented for earning one of the above-named cash prizes during this volume by sending us an essay on Substantialism or collateral discussions. Remember, these essays must not be more than a single solid page of this paper, in brevity type,—1,200 words. See this announcement as first made in December, or in No. 1. of this volume. A number of writers, as we learn, are preparing themselves by study for this contest.

## What the Press Say.—A Mere Specimen of Hundreds of Unsolicited Notices.

### "A Masterly and Triumphant Refutation."

[From *The Christian News*, Glasgow, Scotland.]

One of the most trenchant and masterly opponents of this theory (Darwinism) is Dr. Wilford Hall, of New York. Some time ago he wrote a book entitled *The Problem of Human Life*, in which he subjects to a searching and critical analysis the strongest arguments in favor of evolution advanced by Darwin, Haeckel, Huxley, and Spencer, the acknowledged ablest exponents and advocates of the system. Never, we venture to say, in the annals of polemics, has there been a more scathing, withering, and masterly refutation, read or printed. Dr. Hall moves like a giant among a race of pigmies, and his crushing exposures of Haeckel, Darwin & Co. are the most sweeping and triumphant we have ever read within the domain of controversy. If our thoughtful and critical readers have not yet read the book, we venture to prophesy that they have a treat before them.

### "The Book of the Age."

[From *The Methodist Protestant*, Baltimore, Md.]

This is the book of the age, and its unknown author need aspire to no greater literary immortality than the production of this work will give him; and thousands of the best-educated minds, that have been appalled by the teachings of modern scientists, will "rise up and call him blessed." Hitherto it has been the boast of atheistic scientists that the opponents of their doctrines have never ventured to deny or to solve the scientific facts upon which their theories are based. But our author, accepting these very facts, unfolds another gospel; and Tyndall, Darwin, Haeckel, *et al*, are mere pigmies in his giant grasp.

### "The Most Startling and Revolutionary Book."

[From *The Brethren at Work*, Mount Morris, Ill.]

It is unquestionably the most startling and revolutionary book published in a century. There is no escape from the massive accumulation of facts and the overpowering application of principles in which the work abounds from lid to lid. It marks an epoch in the centuries. It is a work of Providence, and will not accomplish its mission in a generation. It unfolds truths that will stay as long as Christ is preached. Although strictly scientific, its one aim is the demonstration of a personal God and a hereafter for humanity. We never tire reading it. It is an exhaustless mine of Christian truth. It is the literary *chef d'œuvre* of the age. It is worth its weight in diamonds.

### "Meets the Wants of the Church."

[From *The Dominion Churchman*, Toronto, Canada.]

We most cordially concede to *The Problem of Human Life* the well-earned title—the book of the age. Doubtless the God of Providence has raised up the author to meet the wants of the Church in this time of need.

### "Originality, Thoroughness, and Ability."

[From *The New Covenant*, Chicago, Ill.]

We can truly say we are amazed at the originality, thoroughness, and marvelous ability of the author of this work.

### "The Death-blow of Atheistic Science."

[From *The American Christian Review*, Cincinnati, Ohio.]

The author, a man of acknowledged genius, and confessedly the brightest scientific star of modern times, has startled the religious world into transports of joy and praise. No religio-scientific work has received both from the secular and religious press such willing and unqualified praise as *The Problem of Human Life*. It is the death-blow of atheistic science.

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[From *The Journal and Messenger*, Cincinnati, Ohio.]

*The Problem of Human Life* is a very unexpected contribution to scientific polemics, which, if its reasonings shall be justified, on thorough investigation will prove to be one of the loftiest achievements of this age, and effect one of the mightiest scientific revolutions ever seen.

Canvassers will be supplied free of cost with bundles of the *Microcosm*, on application, to enable them to leave copies with intelligent families. For information both as to the book and the paper, address the Editor, 33 Park Row, New York.

Press of H. B. ELKINS, 13 and 15 Vandewater Street, New York.

# The Microcosm

A MONTHLY JOURNAL OF SUBSTANTIALISM AND COLLATERAL DISCUSSIONS.

THE ORGAN OF THE SUBSTANTIAL PHILOSOPHY.

A. WILFORD HALL, Ph. D., LL. D., Editor and Proprietor.

(Author of the "Problem of Human Life," "Universalism Against Itself," Editor of the *Scientific Arena*, &c., &c.)

ROBERT ROGERS, S. L. A., Associate Editor.

Address all communications to A. WILFORD HALL, 23 Park Row, New York.

Vol. VI.—No. 6.

MAY, 1889.

50 Cents a Year.

Entered as second class matter at the New York Post Office.

## INCONSISTENCIES OF THE MOLECULAR THEORY, No. 3.

BY THE EDITOR.

(Continued from April, page 66.)

According to the teaching of present science all material bodies are composed of incompressible and indivisible atoms constituting molecules which are separated from each other by many times their diameters, while it is also claimed that these ultimate constituents of matter are in constant and rapid vibration, hitting each other as they chance to collide.

If bodies are constituted of molecules composed of atoms, we will first assume that such bodies contain nothing but these molecules, and that the spaces between them are vacant, or absolute vacuums.

Now these molecules according to "science"—taking air as a test body for investigation—are 2500 times their diameters apart, while this prodigious amount of vacant space, in proportion to the matter which it contains, is free from any substance whatever.

The object of the molecular theory of air seems to be to account for the vast amount of compression our atmosphere will stand before becoming a liquid or a solid, and this is the only way science pretends to explain its great compressibility as when we force these ultimate molecules nearer together. As it takes about 2500 atmospheres pressed into one, in the absence of all possible heat, to convert air into an incompressible liquid, and thus bring the molecules together, hence the guess that the molecules should be 2500 diameters apart.

But look at the prodigious miscalculation of the framer of the theory. These molecules of air need not actually be more than fifteen diameters apart to admit of 3000 atmospheres being pressed into one, and still the molecules come no where near touching! But that wonderful inventor of the molecular theory, whoever he was, supposed the molecules should be 2500 diameters apart in order to account for this remarkable compressibility of air! A greater bungle never occurred in science.

But here the problem presents itself: why do not these incompressible particles fall together of themselves when there is nothing but empty space intervening? But we are getting in advance of our story. We will attend to this absurdity after a little.

'Tis true this molecular science, in trying to steer clear of obstacles on the one hand, com-

plicates the difficulties of its own assumption by telling us that these enormous spaces between the molecules of our air, contain a still thinner and more highly elastic air called ether. But strange that the advocates of the theory can not see that this does not help the difficulty in the least. It simply puts the denouement farther away from reason's searching lash, by interposing another but more attenuated material atmosphere, whose molecules in reality and of necessity are the same distance apart in proportion to their diameters as are those of our air. It surely does not dispose of the existence of these latter empty spaces between the molecules of ether any more than would the placing of cannon balls in a field 2500 times their diameter apart, and then placing between them bird-shot 2500 times their diameter apart! Not a single bird-shot need touch a cannon ball, just as not a single molecule of ether need touch a molecule of air, while leaving the great bulk of the vacant space still a perfect vacuum, the same as before the assumption of ether had been lugged into service! Truly the way of the scientific transgressor is hard.

To assume in desperation, in order to avoid this stultifying state of things, that the inter-molecular ether is not composed of molecules like solid bodies or like air, as the very word inter-molecular admits, would be to concede at least one material substance to be homogeneous, and thus, at a single blow, to wipe out all necessity for the molecular structure of matter however gross! Don't you see?

Hence, if air is "composed of molecules" 2500 times their diameter apart, so must ether be, its molecules being proportionately smaller, and the same absurdity, therefore, which we are about to expose in the case of air can not be parried by the interposition of a material "jelly-like ether," since its molecules must submit to the same inflexible logic.

If, for example, material ether with its molecules and its spaces fills the spaces between the molecules of air, we squarely assume that these similar spaces between the molecules of ether are absolute vacuums, since no stretch of the molecular imagination dares to assume another material make-shift like ether, but still finer, to fill the interstices between the molecules of the original "jelly" of Huygens! Should any one have the hardihood to assume this, in order to avoid a fatal collapse of the whole molecular theory, then that second ether with its material molecules, separated 2500 times their diameters apart, would necessitate a third ether still finer, and by the same



inexorable logic must be composed of correspondingly smaller material molecules and so on *ad infinitum*! And then in the name of reason, what would such an infinite gradation of material *ethers*, with molecules still smaller and smaller than the original molecules of the air demonstrate, except the infinite reduction in size or divisibility of the particles of matter, which of itself destroys the molecular theory?

We therefore discard this entire etheric assumption at the start, and take for our consideration the basic principle of the molecular theory, that the air is "composed of molecules" which are 2500 times their own diameters apart, that they are in motion bombarding each other, whenever they happen to hit, at the enormous velocity of 1500 feet a second, and that these inter-molecular spaces are absolute vacuums.

In the first place, it is an admitted law of motion among material things, as pointed out last month, that two incompressible bodies of the same weight, whatever their size, coming into direct collision at the same velocity must come to rest.

No scientific man will dispute this, since such colliding bodies can not rebound for want of elasticity, and elasticity can only exist where bodies are compressible or capable of being indented.

Now, we do not inquire into how these assumed molecules of air first obtained their supposed motion. Say, if you will, that their motion was originally given to them by the Divine fiat. Then, unless such motion is kept up by direct miraculous interposition, the inexorable operations of the physical laws must inevitably and in a very limited time bring them to quiescence.

To show this more clearly, we need only enlarge the supposed scene of molecular bombardment to a ten-acre field of incompressible cannon balls, as we have before illustrated, set flying hither and thither by the same Divine power and moving in a perfect vacuum, and no one is so defective in intellect as not to see that such balls, in making hundreds of collisions a second, whether direct or glancing contacts, must of necessity exhaust their original force and all come to absolute rest in a very few minutes.

Indeed, these balls, if not colliding at all, can not change their vibrating direction without consuming a considerable portion of the initial force which gave them their motion, however such force may have been stored up in a condition to do work, as in a tuning-fork's prongs.

The same law must prevail among molecules no less than among planets. To assume any other result for smaller material balls, because forsooth they are beyond the range of vision, and thus to give free play to a highly flexible imagination, is to surrender the mind to a superstitious freak of headlong hallucination only compatible with the surroundings of a madhouse.

We thus deduce the logical conclusion that if the air is composed of molecules as claimed by the theory, and if such material masses were ever put into motion, as supposed, they have long since come to rest by the unavoidable expenditure of their initial force through their continuous collisions. We therefore assume the air, if constituted of molecules at all, to be at rest, thus giving the theory all and a

good deal more than it has any right to ask.

This theory now tells us that in compressing the air we only force the molecules nearer together, but never so near as to make them touch. This can not be true, since we have found of necessity that the spaces between the molecules are entirely vacant, and the molecules themselves, if any such things exist, are quiescent. Why then should it require great force to move them nearer together?

Minute balloons, floating by the hundred in a still room, can be crowded together till they touch, even against the resistance of the air, without the exertion of even appreciable mechanical force. Yet these floating molecules, according to the theory reduced to its last analysis, can not be crowded together, with absolutely nothing between them, even with thousands of pounds pressure applied! Funny, is it not, when the inter-molecular spaces, as we have seen, contain nothing?

But does some etheric reader again respond that these inter-molecular spaces do contain something—that they are full of *ether* according to the theory, notwithstanding our criticisms to the contrary, and that this is what prevents our compressing the molecules of the air together?

We ask in reply, why should this almost infinitely tenuous *ether* cause such tremendous resistance to the movement of these perfectly free and suspended molecules of air, when a receiver from which the air has been pumped, but which according to the theory is still full of *ether*, will allow the lightest feather to fall through it as swiftly as if it were a piece of lead?

Again, does some other inventive reader suggest that it is the repulsion which exists between the air-molecules more than the *ether* which prevents our pressing them together? Then how is it that they keep up an incessant bombardment, constantly hitting each other according to the theory, when their repelling force will resist tens of thousands of pounds of mechanical pressure to the square inch, and yet these same self-bombarding molecules can not be made to come any where near touching each other?

If these material molecules are capable of thus shooting hither and thither at a velocity of 1500 feet a second, and with a momentum sufficient to overcome the resistance of the inter-molecular *ether* and the repelling force of the molecules equal to thousands of pounds pressure to the square inch, why is it, in the name of reason, that such a vicious bombardment can not be felt by the most sensitive cuticle?

The molecular theory teaches that these collisions of the molecules among themselves are what constitutes *heat*, and that when we suddenly compress air the heat observed is the result of a greater number of the collisions of the molecules and their more powerful effect on account of their greater proximity to each other. This, however, can instantly be shown to be both false and absurd.

In the first place we refer to the law which we had the honor of announcing in the *MICRO-COSM*, vol. v. page 160, that all the heat observed in suddenly compressed air was in it before the compression took place, and just like the air itself this substantial heat-force was brought into a smaller compass, and was thereby in-

tensified in like proportion as the air was made denser.

No one pretends to question the truth of this law, as opposed to the motion-theory of heat, who has examined its claims.

Then, still further to show the fallacy of the notion that the observed heat in compressed air consists in the more rapid and more powerful collisions of the molecules in consequence of their nearer proximity to each other, we need only note the self-contradictory fact that if the air, thus compressed, is allowed to stand a few minutes, its heat radiates and the air keeps on at exactly its old temperature, notwithstanding its molecules still remain in the same proximity! Why do not their more frequent and powerful collisions keep up the heat of the air right along if that is what constitutes heat?

According to this theory, the more dense a body, and consequently the less compressible, the nearer its molecules must be together, and hence the more heat it should be generating and sending off all the time. If there be a shred of truth in this theory, that molecular collisions are the cause of heat, then mercury ought to be boiling hot all the time, by the rapid collisions of its molecules, they being in such very close proximity, since thousands of pounds pressure to the square inch will not condense it to the slightest appreciable degree. What are its supposed molecules about in their bombarding exercise, that they do not keep the quicksilver boiling? Echo answers—"What?"

The truth is, nothing in science but the new physical law to which we have just referred tends in the slightest degree to account for the observed heat in compressed air, while every collateral fact goes to confirm its correctness.

If it should be claimed to be the direct conversion of the mechanical force of compression into heat, as Professor Tyndall so positively teaches in his "Heat as a Mode of Motion," why does not the same mechanical pressure which heats air several hundred degrees, if applied to a similar volume of mercury, heat it in like manner?

The fact is, a thousand pounds pressure to the square inch would not warm mercury the perceptible fraction of a degree, while applied to air it would heat it hot enough to fuse lead, simply because the entire quantity of heat already in the air is thereby concentrated to a very small volume, and to a correspondingly high intensity, while the heat in the mercury is not concentrated at all, simply because the liquid containing it can not sensibly be reduced in volume.

What, then, becomes of the molecular or the mechanical theory of heat in the light of the overwhelming facts here set forth?

If there were one shred of sound scientific truth in the dynamic theory of heat as relates to the so-called molecules of matter, or as set forth in "Heat as a Mode of Motion," the very same conversion of mechanical energy into heat ought to take place in a given pressure upon a piece of steel as upon a mass of confined air.

The fact, however, of the total absence of heat in the steel under great compression, takes every breath of vitality out of that great textbook of Prof. Tyndall, regarded as almost sacred in the colleges of the civilized world.

But this article is already too long, with our exposé of the inconsistencies of modern science

not yet finished. The reader will please wait another month.

#### PRIZE ESSAY No. 8.

#### The Duality of Substantialism.

BY THOMAS MUNNELL, A. M.

The natural world like the human body has a soul in it. As every joint and limb, every muscle and nerve, every bone and every drop of blood in said body are under the immediate control of its soul or spirit, so are every grain of sand, every dewdrop, spire of grass, every sea and mountain, every continent and every hemisphere of every world of every universe, under the undeniable dominion of an immaterial substantial soul that pervades all physical being. Under its guidance the heart sets out to beat the march of life by the aid of no visible *vis a tergo*, no leverage, no machinery describable in scientific terms, nor cognizable to the scrutiny of the mightiest magnifiers. In searching for the origin of bodily life physicists have followed the path of nutrition from the stomach to the veins and even to the cells, and as they watch with microscopic intrusion the tiny particles of food floating along in their tiny rivers of blood till they reach those little receptacles they think they see said particles dumped at last into them on one side, as mere physical nutrition, but they come out on the other side as living bioplasts—changed from the not living to the living by some of the immaterial substantial forces that refuse to display themselves to the blundering scalpel, the inquisitive microscope or any other physical test. But in those inscrutable little chambers where bioplasts are formed and from which they set out in troops to build up bones, muscles and nerves, God is always represented by some invisible immaterial force that was put in charge of that special work when the world was made. Whether it is the same mysterious force that starts both the heart-beat and the bioplast we may never know, for these may be different from any force already known, being neither magnetic, electric nor gravitative; for as the spirit of man is possessed of many faculties, so this immaterial incorporeal substantive spirit, pervading all material things, has many faculties among which the supervision of all physical operations is divided.

Paul says of "spiritual gifts" in the Church—"to one (member) is given the word of wisdom, to another the word of knowledge, to another gifts of healing, to another prophecy, all by the same spirit, dividing to every man severally as He will" (1 Cor. xii. 8-10). So has the same creative Spirit divided out "severally as He will" to electricity, to magnetism, to cohesion, to gravitation, to light, to heat, to sound, to odor, as substantial and efficient servants, their respective fields of operation. When the world was made and the roll called, they every one responded, received their commissions and, without the intermission of the thousandth part of a second, have held dominion till this day with unflinching vigilance and power. The *Dualism of Substantialism* is therefore undeniable, for as the body without the spirit is dead, so this whole world without its natural forces would be dead also, notwithstanding materialistic science will have it that this death is averted by the unconquerable power of several "modes of motion" and a few other "nonentities."

As no one has ever measured the length, breadth and thickness of an atom, we may as well say that the number of them in a grain of sand is one thousand. To hold these thousand atoms together in one hard compact grain was part of the work assigned to that peculiar form of force we call cohesion. The grain is the body and the force the soul. And here it reigns in that tiny domain, but reigns just as completely as in a boulder or in a mountain range. It is stronger than gravitation or atmospheric pressure and, therefore, depends on neither to do its work, but is a power of itself, substantial, immaterial, peculiar, and has a faculty belonging to the incomprehensible soul of Nature.

To the faculty of gravitation it was given to round a dewdrop on the bosom of a flower, and to orbiculate the world; to lift the mists to equilibrium in the air, and drop them again in showers over all the earth; to cause the rivers to flow into the seas and to hold the seas in their sunken beds, and by balancing the centrifugal force of the earth to give us orbital motion and with it days, months, seasons, years; and yet this mighty faculty, this Master Commissioner that presides over worlds, systems and universes, is not honored by science even with the title of "mode of motion," being a mere nonentity, destitute of all entitative reality.

Some friends of God and of all true science conceive the physical forces to be simply the divine Will acting in these various directions. This may be true without implying that the admission involves an unceasing exercise of that Will without the intermission of a second since time began, for God could establish a decree that would stand forever, requiring every such force to do its work without His constant attention. But whether said Will be a settled decree or a continuous exertion, it is none the less a Force, a substantial Force, a divine Entity that is as much a part of the physical world as is the soul of man a part of his personal organization. True, the sound force, the gravity force, the light force, the cohesive force, all refuse to be measured by the yard-stick, to be weighed on a Fairbanks, or to yield a negative to the photographer, and also unanimously refuse to admit that, for such reasons, they are not substantial entities. Why not as well try to put a volition on the scales, or have an angel sit for a picture? What philosophy more gross and unworthy a human mind than that which denies the existence of every entity that is not visible? What Philosophy but Substantialism offers with any hope of success to scare off this nightmare of materialism and save men from the horrid conviction that death ends all, that hope is vain and the grave our goal?

Any force, immaterial as well as material, that produces physical results is a substantial, entitative thing and not a no-thing unreal as vacuity, emptiness or shade. Magnetism, electricity, vital force, heat, light—all are constantly changing the positions of physical substances. The first drags a heavy body, the second shatters a forest oak, the third creates and propels both animal and vegetable bioplasts, the fourth melts down all combustibles, the fifth is handmaid to vital force; and while the very nature of sound requires it to deal most delicately with material things it, nevertheless, affects the tympanum, the nerves and brain, producing the most wonderful effects

upon these peculiar parts of the body and through them conveys intelligence of every kind to the mind. Why then deny that the spirit of man whose volitions not only handle his hands, his feet and tongue, but can so train and strengthen his whole physical frame that like Doctor Winship he can finally lift 2100 pounds from the ground? Who would not prefer a philosophy that so helps the Bible and all true science to chase the incubus of materialism from the world and to revive the dying hopes of myriads who have fallen into that "Slough of Despond?" No wonder, then, that glad voices are already being raised all over the land that are destined ere long to break out into a loud *Vive la Substantialism! Vive Doctor Hall and his happy triumph over all the enemies of Hope!* And so shall it be; for "Truth crushed to earth will rise again."

#### SPIRITUALISM ONCE MORE.

BY J. N. PARKER.

DR. A. WILFORD HALL:

*Dear Sir:*—I feel almost as well acquainted with you as if I had known you personally for these many years past. I have studied your Substantial Philosophy, and have read every word of your writings, from the "Problem of Human Life" down to the last number of the present volume of the MICROCOSM, which is now lying before me. I am a Substantialist from the ground up, and see no reason why your positions based on the physical laws are not defensible and sound to the core—your philosophy saved me from Materialism.

But when I came to read your article on "Spiritualism and Theosophy" in the March number, I felt that you stood in need of a little more light on that subject,—especially on the question of the truth or falsity of Spiritualism.

I confess I know very little about Theosophy, but I do claim to know that Spiritualism is true. It is not a matter of faith with me, as in the case of the spiritual communications with man in the times of the prophets, Christ, and the apostles. In those cases we are obliged to trust to the testimony of others, and to the accuracy of the record that has passed through centuries.

Still I am glad to say that I am a believer in Christianity, with all that this term implies, and what is more, my faith in Christ and in the Book of books is greatly strengthened and confirmed by what I have seen and heard, and absolutely know, of spiritual manifestations that are now taking place all over the world.

I have thought of writing to you on the subject for some time, knowing that your demonstrations of the truth of Substantialism must have prepared your mind for the reception of modern spiritual communications so soon as the first genuine opportunity should offer.

That there are frauds and humbugs, as professed mediums, who play tricks of magic for money, is as true as that there were false Christs and pretended apostles in the times of the early church. But it is equally true that there are honest mediums and genuine communications from departed friends whose spirits now live in a conscious state separate from material bodies.

I have seen, for example, intelligent movements of tables and chairs in answer to questions, when such pieces of furniture were positively beyond the control of the medium;



and I have held a sealed slate of my own which received at my request a written and intelligent communication on the inside. This I positively know was from the spirit of some person not in the body or separate from material conditions. I know it as surely as I know I see a man when he stands right in my presence.

Now, why should Christians exhibit such bitter prejudice against these intelligent manifestations which would at once demonstrate a future state of existence? They claim to believe in exactly similar communications that took place more than eighteen hundred years ago.

It seems to me these present manifestations, if genuine, are the very thing the clergy should seek to encourage and obtain, as they would not only convert every infidel and materialist in the land, but would confirm doubting Christians.

The truth is, the best and most pious of Christians doubt at times, simply because the facts on which our religion is based occurred so many centuries ago. What a godsend then to thinking men to have our departed friends, even occasionally, obtain permission to give us an absolute proof of a conscious existence of the soul after it leaves this earthly tabernacle! And how absurd it seems to me for professed Christians to oppose with anger and hatred those who claim to have witnessed these physical proofs of a future life!

I am glad to have the proof from your own able pen that you are free from prejudice and bigotry, and that you court such genuine demonstrations if they can be had. To deny their possibility, it seems to me, is flatly to deny Christianity, which was made up of just such communications from the spirit world through the medium of prophets and apostles.

I believe you will yet be convinced by genuine spiritual demonstrations, as I have been over and over. I have had innumerable proofs of the genuineness of these communications from the super-mundane world.

The Substantial Philosophy has demonstrated the reasonableness of the existence of the conscious, organized soul after death. Now it only needs an absolute communication from one of those intelligent organized souls to round out your philosophy of the future state and make it a living, tangible, and demonstrated fact.

Can it be possible that the 10,000,000 intelligent professed spiritualists, as admitted to be now living even in the United States, are all either idiots or lunatics? It does not seem reasonable. I repeat my belief that you will yet live to be convinced of the truth of Spiritualism. So mote it be.

San Jose, Cal.

#### REMARKS BY THE EDITOR.

We confess we like the spirit in which Mr. Parker writes, and we see little to criticize in his Spiritualistic logic. If he has positively witnessed the physical demonstrations he describes, and absolutely knows that the medium had nothing to do with them, he is assuredly not to blame for his faith in Spiritualism.

But, nevertheless, with all our conviction of the sincerity of our correspondent, we still believe that he has been deceived.

It was no doubt as already a believer in Spiritualism that he witnessed these movements of furniture and this writing upon

sealed slates, and in the capacity of such believer, we do not think it possible for any man, however intelligent, to be in such a frame of mind as to be capable of forming a reliable judgment upon such claimed supernatural phenomena.

We have not the least shadow of doubt but that Mr. Parker really thought the intelligent message, which appeared written inside the sealed slate, was so written beyond the control and without the connivance of the medium present. But we believe, on the contrary, that the message was there written before the slates were sealed, and that it was done by the dexterous manipulation of the cunning medium, whoever he or she may have been, at least for the love of deception, or possibly for the love of money.

If Mr. Parker should attend one of the magical exhibitions of Mr. Keller, now performing in this city, hand him his gold watch, and then see him drop it into a mortar right before his eyes, and with a pestle smash it into a hundred fragments and pour out the broken wheels into a cup, he would be just as positively sure that his watch was hopelessly destroyed as he now is that the slate trick he witnessed was a genuine communication from some departed spirit.

But for the fact that the magician, more honest than the medium, avowedly smashes the watch as a mere trick of legerdemain, after which he returns it to its owner safe and sound, every person in the audience susceptible to modern Spiritualism would go away believing that an actual miracle had been wrought.

Now we do not deny the possibility of communications from the spirit world, should the Ruler of the Universe so will and so order, nor do we deny the possibility of any other miraculous interposition should the present order of the divine economy require it. To deny such possibility is to deny the existence and the power of God, as also the existence of the conscious soul of man after death, a fact which Substantialism as positively teaches as does Spiritualism, and gives numerous scientific reasons therefor.

We go even further and agree with Mr. Parker that such direct and palpable demonstrations as he thinks he has witnessed from the spirit world, as a physical proof of the existence of the conscious soul of man after death, would be very desirable and gratifying to skeptics were they only possible. It is not, however, a question of desirability or human gratification, but a question of fact, as based upon evidence.

It would be very desirable, and a matter devoutly to be wished, if there were no mosquitoes or other insect pests; if there were no miasmatic germs to cause malaria; if there were no poverty, sickness and death. But the necessity or the desirability does not seem to demonstrate the fact in the cases named.

Because we would all be glad to witness genuine miracles, is no reason why we should stupidly deceive ourselves or allow others to deceive us with mere tricks of magic and sleight-of-hand performances.

I believe the tendency of this delusion called Spiritualism is to cause its adherents to exaggerate everything connected with the subject. When once thoroughly imbued with a belief in this doctrine, the superficial tricks of a medium are at once magnified into the most

marvelous demonstrations from the spirit world. This state of facts we have often witnessed.

We have observed a company of Spiritualists sitting in a *seance*, with the solemnity naturally inspired by the supposed conscious presence of departed friends, and have seen them startled into ecstatic astonishment at the supernatural squeaking of a chair or the accidental movement of some one's foot! And in conversing with them after the *seance* we have found that nothing could convince them to the contrary, but that these sounds were from the other world. Such is the strange effect of a hallucination when it once gets full possession of susceptible human nature.

Mr. Parker assures us that there are not less than 10,000,000 Spiritualists in the United States. This no doubt comes from the same tendency to exaggeration. We do not believe that there are 1,000,000, or even 100,000 mature and intelligent believers in Spiritualism in all the civilized world. And what is more, we honestly believe that the number will become less and less as scientific and true philosophical knowledge shall advance.

Still, notwithstanding this conviction, we will be only too glad to have any medium, from Dr. Slade down, exhibit at this office, or anywhere in this city, a slate-writing test that shall unquestionably come from the spirit world without human trickery, and we promise faithfully to lose no time in announcing the same in the MICROCOSM.

Prize Essay No. 9.

MATERIALISM vs. SUBSTANTIALISM.

BY REV. E. R. MCGREGOR.

Materialism and Substantialism are two theories or systems of doctrine introduced into science to account for the phenomena connected with matter throughout universal nature.

Materialism affirms that there is nothing in the universe but matter; and no phenomena but matter in motion; as light, sound, heat, electricity, magnetism, gravitation, odor, life, mind, etc. That when the motion ceases the phenomena cease; as when the ethereal waves in space are quiescent, light becomes non-existent; when the sonorous waves of air subside sound is a nonentity; when the organic atoms of matter pause in their operations, life becomes extinct; when the brain perishes, mind vanishes. Should all material motion cease, there would be nothing left but inert and quiescent matter.

But even if it accounts satisfactorily for these current phenomena, which is denied, it fails at the very foundation of all things. If that theory affirms that matter is eternal, it hesitates to say that matter in motion is eternal, because then it must admit that motion is a quality inherent in matter. Pausing at the threshold of nature, it can not tell us how matter was originally set in motion.

Suppose at some point in eternal duration matter was universally inert, two atoms, lying contiguous to each other, which had always been in that relation, began to move,—the first throughout all the realms of matter. Materialism can not explain how they came to start into motion. There must have been a first motion, or else all motion is eternal, which it does not admit.

Again, Materialism is deficient, after having passed through the temple of nature and accounting for all it has found there, when it steps off the threshold of its back door, where a thousand and one things have been thrown by its inmates. Mind, it says, is matter in motion; when the motion ceases there is no existing mind.

But this mental motion has produced some things which, if they also be in motion, they are not at all connected with matter; are eternal in their very nature, after once being produced. Mind discovered what was never known before, and therefore produced it,—the axiom that "things that are equal to the same thing are equal to each other." This axiom never existed before, now it exists, and though the mind cease, it shall exist forever; and whenever, through eternal ages, brain motion eventuates in mind, it will find this axiom still existing.

Here is a right-angled triangle. The mathematical relation of its sides is unknown as a fact. A brain in motion, called mind, demonstrates the proposition that "the square of its hypotenuse is equal to the sum of the squares of the other two sides."

Here we have two entities and verities that shall never cease to be,—the fact and the demonstration; though the originating mind became *non est* centuries ago. Two human material organisms are moved into the relation the one to the other, of benefactor and beneficiary,—a brain in motion, observing the relation instinctively infers that the beneficiary owes gratitude to the benefactor; and that to pay the debt is right, not to pay it is wrong.

Now the reasoning brain may perish, but the principle of obligation, and the distinction between right and wrong, for the first time discovered and formulated, shall be practical entities and verities forever. The axiom, the mathematical proposition, and the moral principle, are representative of all like productions of brain motion; so that, besides matter and matter in motion, we have this third class of entities as stable as matter. Here we have this curious phenomenon of perishable causes of imperishable effects, of which Materialism, in its defectiveness, takes no account. Hence Materialism can not account for matter in motion, nor for the entitative effects of matter in motion, but having the head and the tail of the fish, it claims to give a tolerable guess how the body subsists and sports in this ocean of wonders.

Substantialism affirms that there are matter which is inert in its nature, and the phenomena connected with matter, and their separate or united products. Matter is absolutely passive; the phenomena, called by Materialism matter in motion, are forces in the handling of a Supreme Entity, who has inherent power over all forces, and superlative wisdom to guide the power. He sent out light to enable the eye to bring His handiwork in matter to the apprehension and contemplation of created mind; sound, so that the ear could charm the mind with its utility and harmony, and soul could commune with soul; heat, to hold unorganized and organized matter in abeyance to be manipulated and rendered useful; electricity, to feed the life force operating in organized matter; magnetism, to maintain a perfect equilibrium between the forces in excess against those that are deficient; gravitation, to preserve the relations subsisting between

bodies of matter in motion or at rest; life, to build up organisms out of the germs furnished to hand, and after the fashion of the types in the germs; mind, to study the hidden things of the Supreme and find Him out, and know Him, and grow up into His likeness. Matter is not essential to the existence of these and other forces, although it is made the base of their sensible operations. Substantialism goes back in the past eternity and watches the two atoms of matter the first to move in deviation.

It finds there the forces of gravity, heat, electricity, life, etc., and power of attraction, bringing them into union; and a germ principle furnished, all under the superintending wisdom of the Supreme Entity, the primitive source of all these forces; and the atoms of inert matter move and become instinct with life, and a physical organism results.

This is an illustration of the causes of all inert matter in motion, whether the invisible atom, animalcule, man, or a world. Whence all these forces? As estimated, they are the entities in the keeping of the Supreme Entity. By the author of Substantialism they are denominated substantial but immaterial entities in contradistinction to inert matter. Matter, however highly sublimated, can never escape detection by the organized senses of created mind in some world. Substantial forces can never be brought within the ken of sensation in this or any world. We take cognizance of matter in all its forms and conditions by the senses and effects; of the forces, solely by their effects. Substantialism, by establishing the fact that sound is a substantial force, and not the air in motion, as is held by Materialism, lays the ground for the inference that all the phenomena, affirmed by Materialism to be matter in motion, are not motion but independent immaterial substances or entities, each having its own characteristics, and being essentially connected with the being of Him we call God, they are imperishable.

Thus the human mind, as well as all mind, is a thinking force or personal substantial intelligence, sent forth from the substantial being of God on a mission, to return to Him again when the mission is accomplished; to be sent forth again and again, as His wisdom devises; thus on for eternity. Once entered on its career, its life is eternity to come. While Materialism undermines the foundation of all that is of any real and lasting value to mind in its mortal state, its personal God and its hope of immortality,—Substantialism tears away its fabric, removes the debris, and sets the soul of man on an unobstructive highway, to a grandeur of being, only pausing short of the divine glory itself.

Ballston, Va.

#### IS MAN NATURALLY IMMORTAL? The So-Called Soul-Sleeping Doctrine.

BY DR. J. K. THOMAS.

DR. A. W. HALL:—By the favor of Dr. L. C. Thomas, my brother, of Dover, Del., I have before me the new MICROCOSM No. 1. I readily enclose the 50 cts.. I do not do this because I can endorse all you teach; but just so far as I can do so, without being a hero worshipper, I admire the man—Wilford Hall—and have for him but one regret, viz., that he does not hold the truth in relation to the nature of man.

While I may be able to accept your Substantial Philosophy as such, I can not accept your

deductions therefrom in relation to man, viz., that such a philosophy is proof of man's immortality. I am unable to accept this position as I am unable to accept the position that the old philosophy is proof that "death ends all."

I may, perhaps, grant this much, that the "Substantial Philosophy" proves the possibility of man's immortality. But that Book of books teaches me that "God only hath (inherent) immortality;" that man may have it if he seeks for it in God's own appointed way; that "Jesus Christ abolished death and brought life and immortality to light through the gospel." Therefore God has said that to those who "seek for glory, honor and immortality, He will render eternal life."

Immortality, then, is an endowment from God, to be bestowed upon those who have developed a godly character at the resurrection of the just. Therefore the apostle says, "If the spirit of Him that raised up Jesus from the dead dwell in you, He that raised up Christ from the dead shall also quicken (make alive) your mortal body by His spirit that dwelleth in you." Rom. viii: 11. Again the apostle says: "This mortal must put on immortality, and this corruptible must put on incorruption." When? At the "last trump," when the righteous "dead shall be raised incorruptible." The apostle placed so much importance upon a resurrection, not of the body simply, but of "the dead," that he said, "If Christ be not raised your faith is vain,—then they which are fallen asleep in Christ are PERISHED."

\* \* \* \* One thing more and I shall have done. If I have been correctly informed, Robert Roberts, of Birmingham, England, offered to discuss the points at issue between us, but that you did not respond. If this be so, Doctor, you ought not to complain of those of the old philosophy who will not meet you on fair grounds.

Rochester, N. Y.

#### REMARKS BY THE EDITOR.

Although the MICROCOSM is not in any strict sense a religious journal, or devoted to theological discussions, except as they come up incidentally in connection with those of science and philosophy, we are nevertheless glad that Dr. Thomas was so frank as to express his dissent from Substantialism on the ground that it favors the immortality of the soul as inherently man's endowment from his Creator's hand.

In other words, the Doctor objects to the Substantial Philosophy because it does not harmonize with the so-called "Soul-sleeping" theory, namely, that when we die, as conscious personal entities, we die, soul and body, and remain dead till the resurrection of the body at some period in the distant future.

Now we frankly say that we do not believe that this doctrine of the death of the soul or of our spiritual entity, comports with either reason or the Bible when properly understood; and though we have frequently been urged to discuss it in the MICROCOSM, we have declined to do so, for the reason that theology, *per se*, is not now in our line, nor is it in the line of our little MICROCOSM.

But we do not like to be taunted with semi-cowardice, as hinted by Dr. Thomas, with reference to Dr. Roberts, of England. Hence a word on human "immortality" must now be considered in order.

First of all, we deny the right of Dr. Thomas,



Dr. Roberts of Birmingham, or of any other theologian, to run against science, reason, and the fitness of things in order to force them all into harmony with certain interpretations of Scripture words or phrases which they may see fit to adopt.

There are hundreds of words and phrases in the Bible that manifestly have different meanings as employed by the different writers of the sacred volume, and even by the same writer on different occasions, and that, too, when the word or phrase is exactly the same in the original Greek and Hebrew. We need not stop here to prove this, because the fact as stated is patent to every student of the Scriptures.

What right, then, have we to fasten inflexibly upon a possible definition of a given phrase or Scripture word, and then insist upon this as its uniform meaning, in order to maintain a pre-adopted creed, however much such uniformity of meaning may conflict with other passages of Scripture or with our own cultivated intuitions?

We have no right, out of pure pertinacity, for maintaining an unchangeable definition of a Bible term to force heaven, earth, science, nature, philosophy, reason and common sense all to bend or break in order to harmonize with such an arbitrary view.

By this same method of fastening upon a few determinate interpretations of Bible terms the flat-earth or zetic philosophers spurn all the rational laws of science and nature, and contradict all demonstrated facts as well as their own senses, in order perversely to maintain their flat theory, because, forsooth, the Bible teaches it according to their childish and irrational interpretations of certain Scripture sentences.

We protest against this reckless lugging of the Bible into the support of every wind of doctrine in order to bend it to some favorite theological notion or tenet.

Let us now look for a moment at the passages of Scripture quoted and referred to by Dr. Thomas, which are the stock in trade of every "soul-sleeper," from Dr. Roberts down.

We premise by saying that "immortality," the chief word on which this whole dormant soul doctrine rests, is just as variable in its signification as almost any other important word in Scripture, and must be determined by its connection.

Let us see: God "only hath immortality." How does Dr. Thomas know but this "immortality," which alone belongs to God, has reference entirely to *life* that has neither beginning nor end? Clearly, this is what it means, since it has no reference to, but excludes, other or created beings then living in the spirit world. Such beings were plentiful there at that time; such as angels and spirits of men who had lived on earth,—Enoch, Elijah, as well as Moses and Elias, who came out of that spirit realm on the occasion of the transfiguration on the Mount.

The torturing of these persons into their material dead bodies for exhibition is irrational, and is unworthy of men who wish to reason fairly.

Yet, while thousands of angels and men were spoken of as intelligent spirits, even then in full possession of their *individual immortality*, God was said to be alone the possessor of his kind of *immortality*.

Christ, it is true, brought "life and immor-

tal to light by the gospel;" but this "immortality," as well as the "life" here spoken of, existed before, as the very text itself proves, since nothing can be brought to light that did not exist previously.

The miner may bring diamonds "to light" from the hidden depths of South Africa, but he surely does not create the diamonds by thus bringing them to light.

So Christ brought to light, and illustrated and proclaimed the fact that within every human being is an immortal spirit that does not die with the earthly tabernacle, but that may even be happy in paradise the very day of its separation from the body.

Then through his inspiration his apostles also taught that we have an "inner man" as well as an "outer man," and that while the latter is *perishing*, the other did not tend in that direction at all but was being "renewed day by day."

It was this immortal "inner man" spoken of by Paul that was to "*depart and be with Christ which is better*" than to continue in this perishing body.

Dr. Thomas and his soul-sleeping brethren would have corrected Paul, and assured him that there was no *departing* to be with Christ about it,—that his inner man and his outer man would both die together, sleep together, and rot together for that matter, till the resurrection day thousands of years hence; and as for being "with Christ which is better" this was impossible unless Christ had not risen and unless he was still dead and in the grave,—spirit as well as body.

Take the Doctor's next passage quoted:—That we must "Seek for glory, honor and immortality," in order to gain "eternal life." Here also *immortality* is used in a very different sense. We surely, as Dr. Thomas would admit, do not seek for the *immortality* which belongs to God alone, for that no one can have whether he seeks for it or not.

It is not the immortal or imperishable life of our personal existence that we are seeking for; as the text itself refutes such an idea, "eternal" life, or this immortality of Dr. Thomas, being the reward for this seeking after immortality.

A man may seek for, and gain a kind of *immortality* even here on earth, which is the honor, love and praise of his fellow men; in like manner we are taught to seek for the praise that comes from God and not from man. This is the higher kind of "immortality" we are commanded to "seek" after in order to have rendered unto us "eternal life," namely the immortal praise, the imperishable honor, and the fadeless glory that cometh from God alone.

The truth is, the whole doctrine of "immortality" as understood and taught by this superficial sect of Christians, though an excellent people by the way,—is based upon a complete misinterpretation of the word "immortality," as it variously occurs in the Bible. We trust that Dr. Thomas will see this, and not precipitately condemn Substantialism for rejecting a doctrine so repugnant to every intuition of our better nature, as well as so directly opposed by the very passages of Scripture brought forward to support it as we have here shown.

We could thus easily turn this soul-sleeping doctrine against itself by analyzing every other text in the Bible where the word "immortality" or a similar word occurs had we

time, and should we wish to extend this line of discussion further in the *MICROCOSM*. We had some experience, as a few of our readers remember, forty-five years ago in turning absurd biblical criticisms against themselves, and we have not entirely forgotten how the thing was done. We would not even now have given this brief specimen, had not Dr. Thomas inconsiderately pricked us again with the unguarded little challenge of Eld. Robert Roberts, of Birmingham, England.

**The Art and Philosophy of Great Longevity,  
or How to Attain Vigorous and Youthful  
Old Age.\***

**PREFACE.**

BY THE EDITOR.

Numerous small works with formidable titles have from time to time been published, both in this country and in England, purporting to give the true secret of health and longevity, some even claiming to tell how the average man or woman may attain the age of one hundred years. But in every such instance, so far as the writer has observed, these publications have been secretly in the interests of some patent medicine or medical business, and for plausible effect have uniformly included, with various special prescriptions of medicine, the stereotyped hygienic directions for cleanliness, clothing, exercise, food, drink, sleep, ventilation, etc., etc. Not one of these pretentious volumes has set forth anything essentially new to science, such as radical hygienic or physiological discoveries which plausibly and rationally might involve the elements of organic rejuvenation, and by which the seeds of disease and decay could be eradicated from the blood and the essence of pure, life-giving nutrition made infallibly to take their place.

We have not, in fact, read a single one of these writers, who proposes to reconstruct any human organism from a state of permanent disease to one of permanent health, unless it be by some special form of medicine or some system of drug medication, which, of course, he regards as superior to any other heretofore tried. Not one step in advance of the previous therapeutical teaching upon health and longevity do these authors take except so far as one kind of medicine, one method of treatment, or one routine of exercise, bathing, diet, etc., may, in the opinion of such writer, be superior to those previously employed.

Had the present writer nothing newer, nothing more radically original or practically revolutionary to divulge as the true secret of successful and continued rejuvenation and consequent prolongation of life, he certainly never would have dared to appear in print with such a definite and startling proposition as "How to live an average life of 100 years."

The present writer, on the contrary, is well convinced, and has been for many years, that no medicine, of whatever name or character, can touch the real pathological seat of human disease or solve the real problem of the revivification of the physical and vital powers after disease has broken them down; nor does he believe that any form of drug known to therapeutical science can take the first step toward

restoring the normal assimilation of food so essential to health, or keep up the processes of elimination and excretion of worn out tissue and waste material without which, in its most vigorous action, an increase of average longevity must be an impossibility.

The true system of hygienic treatment and the only one worthy to be called a discovery at the present advanced stage of science and civilization, should so conform to the true facts of human anatomy and so co-operate with the real functional processes ordained and carried forward under the physiological laws of our being, that the seeds of decay and germs of disease, which are always finding their way into our circulation, may easily be hastened to escape before they become permanently assimilated with the organic structure.

Could such improved facilities be added to the natural and functional process already going on throughout our organization, by which the germs of decay, that are the sole cause of senility, may not only be prevented from forming a lodgment in the human tissues, but on the contrary may be furnished enormously improved facilities for elimination and excretion, there is not the slightest reason apparent why the person of sound constitution, thus armed with hygienic weapons and physiological facilities, might not retain vital power and youthful vigor almost indefinitely.

This in a word foreshadows what the new system of hygienic treatment proposes to reveal to the world and to put within the reach of every man, woman and child who shall start with a sound constitution and who may wish to live one hundred or more years in the enjoyment of unobstructed health.

Drugs, in whatever form administered, in order to produce remedial effects upon the human organism, must enter into the circulation and thus, by universal consent, produce temporary relief on the principle of generating one form of disease as a means of counteracting another of a more immediately dangerous or at least disagreeable character.

Indeed, it often occurs, as all practicing physicians know, that the counteracting disease superinduced by the medicine, proves to be worse in its effects than the original ailment intended to be removed, many times resulting in the death of the patient.

Though this may be exceptional to the general rule, yet there is no exception to the principle, as before intimated that all medicine to do any good must first produce a counteracting disease, generally of a milder type. Hence, the use of medicine of whatever character is pernicious and wrong if it can be avoided, and is only justified as a lesser evil in consequence of our ignorance of a more excellent way by which all disease can be prevented, and nearly every form of physical ailment cured without drugs of any kind, by merely abetting nature in her own salutary processes.

If this rational view of the vital functions and of true hygienic laws shall be justified by the disclosures and demonstrations of the following pages, then every physician in the land, whatever his system of medical practice or therapeutic prejudices from long experience may be, will hail with joy the new departure however crudely it may here be set forth, or however radical and revolutionary its claims for an improved hygienic treatment may be.

It is the ineradicable belief of the writer, from forty years of experience and careful

\* From a work of this Title by the editor, which was to have been published, but which was abandoned, for reasons given in the April number of the present volume of the *MICROCOSM*, a condensed pamphlet having been printed instead.

observation, that no medicine ever taken into the human system in order to act effectively, but leaves the organization as a final result, the worse for its wear and tear, however much temporary relief from a worse form of disease such medicine may have afforded.

As proof of this, witness the rapid strides toward senility of those who constantly resort to the various forms of drugs to counteract the ills that flesh is heir to, compared with the man or woman of equal years whose health and habits have been such as to require little or no drug medication. The one is sallow, rugous and apparently bloodless, even before reaching the prime of maturity, while the other has the ruddy glow of youthful circulation and healthful vigor even long after the meridian of life has been past.

Of course this comparison relates only to such as start in life with equal and average constitutions, and who, though subject to ordinary ills and exposures, have not encountered any deadly or virulent forms of constitutional disease. The writer's own case, as a confirmed consumptive, given up by his physician to die at the age of 28 or 29, is not to be included in either category above, as the next chapter will fully set forth; and hence, the more apparent credit must seem due to that system of hygienic treatment which, without drugs, has rejuvenated his organism, and now gives to his countenance, at the age of three score and ten, that healthful tinge and appearance of unobstructed circulation witnessed in one of only half his age and in robust health.

His own case thus, as a living illustration, more than all the convincing proofs and arguments of his own philosophy, but in corroboration thereof, goes to confirm the paramount value of his claimed discoveries in the direction of much greater possible longevity to the human race in the near future than any instances at present known, and the rationale of which it is the purpose of this book to unfold.

And as one of its chief objects is to benefit and bless those who may live after the writer is here no more, he has not deemed it wise to wait longer, in the midst of so many fatal accidents, before putting his own unique experiences and the results of what he regards as his most unparalleled discoveries upon permanent record, that coming generations may not be deprived of their advantages.

Without justly being chargeable with egotism, he claims the right to state that already there is given him credit for some genuine discoveries in physical science; but whatever credit may be due him in that direction, he can say conscientiously, and stake upon it his *posthumous* reputation, that a thousand such achievements all combined into one would be as the dust of the balance in his judgment, when placed against that single physiological discovery which he was led to make more than forty years ago.

Whether or not that discovery may be attributed to a happy combination of fortuitous circumstances, or to any degree of intellectual originality on his part, it matters little now. Of one thing he has no hesitation in avowing his conviction, that when the new treatment shall be properly understood and put into practice, all real necessity for drug-medication will forever be dispensed with, and that by the same hygienic revolution not less than fifty, and possibly one hundred, per cent. may in time be added to the average longevity of man.

Of course the belief thus avowed is based upon the proviso, in part, of the aid of heredity as the practice of the new treatment becomes universal, and as its physical and vital advantages are abetted, augmented and accumulated by transmissions from parents to children.

The treatment thus foreshadowed is claimed not only to counteract disease of every ordinary form by removing its cause,—impurities in the vital circulation,—but what is even more beneficial to humanity in general, it will, if practiced in perfect health, surely and permanently protect us against the incipient formation of diseased conditions and their becoming seated in any portions of the vital structure.

As preventives are always better than cures, the writer would most earnestly recommend the new treatment to persons, even in the most exuberant conditions of health, who may wish to attain vigorous and youthful old age; for surely the new hygienic process regularly employed can have no other effect than to keep pure and uncontaminated the vital fluids of the body, even in the midst of contagion and death. In this way it is believed that youthful vigor may be retained by a normally sound constitution almost indefinitely.

This was the view taken of the new treatment by Dr. Stevens the moment it was named to him in Syracuse, more than twenty years ago,—even before that phase of its advantages had impressed itself upon the mind of the writer.

He was then in the bloom of healthful vigor, and as soon as it was practically demonstrated to him he adopted the treatment and put it into regular practice, solely, he said, as a preventive of disease of any kind getting a foothold in his vital economy.

He reasoned that if the prevention of the germs of decay from entering into the circulation and locating themselves in the organism would counteract and cure a complication of diseases, as demonstrated in the case of the writer, then surely, by assisting nature in advance, it would be a manifold easier process to guard against all forms of disease which originate in such deleterious germs, if they should be entirely kept out of the circulation in the first place, and thus forestalled in their mischievous work.

The result has been that during all these years the doctor has not had one day's sickness, and now, in his seventy-first year, is the healthiest and most vigorous man of his age we have ever looked upon.

Of course, in this respect, he holds vastly over the writer with his already shattered constitution to start with, and with a fraction only of a left lung to watch and nurse, from continually recurring colds at the slightest possible provocation.

Much exciting discussion in the recent and more advanced novels flooding the country is now attracting readers fond of sensational fiction, because the tendency of such imaginative romance, beginning with Bulwer's "Strange Story," is to foster a semi-belief in the possibility of such a discovery as "*The elixir of life and of perpetual youth.*"

The story is even firmly believed by some very intelligent persons now residing in this city who are adherents of that system of refined metaphysics called *Theosophy*, as taught by eastern sages, that the celebrated Madame Blavatsky, who lectured here a few years ago, is not less than four or five hundred years old,



though she has all the appearance of a woman of only forty or fifty. In fact it is positively claimed that persons in India, now nearly a hundred years old, recollect of hearing her deliver lectures in that country sixty or seventy years ago, and that she was then to all appearance of precisely the same age she is now.

It is well known also that she claims to possess the renowned eastern secret of the "elixir of perpetual youth," while a very intelligent lady to whom the writer was introduced, and with whom he recently conversed (an advanced theosophist, by the way), assured him that from intimate conversations she had held on several occasions with Madame Blavatsky she was fully convinced of the truth of the tradition that there was really such a secret well known to favored theosophists of India, and that by the proper use of such occult process or treatment there was no necessity of becoming old, even for hundreds of years, in the ordinary sense of physical and mental senility.

However, this may be (and it is only given here as a report scarcely worth repeating), one thing is certain to the mind of the writer, that no medicine, however refined in its chemical constituents or however magical it may be in its therapeutical effects, can prevent the deterioration of the human organism beyond the hereditary endowments and tendencies transmitted to it by the coincidence of fortunate or unfortunate parental unions.

Medicine has been tried for centuries with increasing quantities in order to achieve the mastery of disease and accomplish the improvement of the general health of the race, and without success, till at last the homœopaths have taken the more sensible course of almost entirely discarding drug-medication,—at least using it in such refined doses as to be almost imperceptible to the senses. So far, at least, they are right, and all they now lack is the treatment here proposed which takes the next great step in pathological and therapeutical science and discards medicine entirely.

Plainly, if the germs of disease and decay can be kept out of the circulation by simply aiding nature in her work, and pure nutrient matter substituted, it needs no argumentation to show the superiority of such a system of treatment over that of drug-medication however gross or refined. Under such new departure alone can we rationally look for any real improvement in the general health and longevity of the race.

It is impossible to conceive of any radical advance in human longevity so long as deleterious drugs are thrown into the circulation, with a counteracting force strong enough to neutralize disease-germs already there. The only possible treatment that can assure improvement in the organic structure by which to increase health and longevity is, as before stated, to aid nature in its own normal process of elimination and self-protection.

To unfold such a system of hygienic improvement, as here foreshadowed, and one that will place physical and constitutional humanity in the coming ages upon a plane vastly more elevated and enduring, and vastly more creditable to our civilization than anything at present known, is the purpose of the following book, already long delayed but now offered to all who may wish to avail themselves of its benefits.

That the discovery therein unfolded practically inaugurates and constitutes the true

secret of continued rejuvenation up to the average longevity of 100 years, and even to a much greater age as the new system shall become general, in order that heredity may add to the advantages of the discovery *per se*, the writer believes as firmly as he believes in any physical law whose operation he has seen demonstrated.

It will, therefore, now become an intensely interesting question for modern research, as this new "elixir of life" is made known, to determine whether the writer has really, by a combination of fortuitous circumstances, stumbled upon the true secret process of longevity which the seers of Indian theosophy so positively claim to possess, or whether he has struck a vital bonanza, *sui generis*, and which is destined to become as beneficial to mankind in the near future as it is novel to the hygienic science of the past and present. The writer awaits this forthcoming investigation and decision with a modest confidence only surpassed by his positive conviction of the truth and value of his discovery.

[The pamphlet spoken of in our "Personal Statement" last month, to be condensed from the book on *Longevity*, and to contain the secret of the discovery, with full instructions for using the same, is now ready to mail. Those who may want to purchase this knowledge are required first to send for a "Pledge of Honor" not to reveal the treatment, or use it except in their own families. Physicians, of course, will be permitted to use it in their practice, but not to show the pamphlet. Terms will also be sent with the Pledge of Honor. Those weary of unnecessary sickness, and tired of paying doctors' bills, now have their remedy. See our "Personal Statement" last month.—EDITOR.]

#### FORCE AND MOTION, NO. 11.

BY REV. J. W. ROBERTS, F. S. SC.

On page 43 of Parker's Philosophy this error is taught: A cannon ball fired from the top of a tower with a force sufficient to send it one-half a mile or six miles horizontally, will reach the ground on a level plain exactly as soon as a ball dropped at the same time perpendicularly to the earth; and the reason given for this is, that "the force of gravity is neither increased nor diminished by the force of projection." The premises are correct but the conclusion utterly wrong, because *it ignores the projectile force as a factor in producing results*. I see an apple falling from a tree, and thrusting out my hand I catch it before it reaches the ground. Do I thereby increase or decrease the hold of gravity upon the apple? Not in the least. Why, then, does it not reach the ground? Because another force intervenes which modifies the action of gravity, without weakening it a particle; for if I let go the apple, gravity at once takes it to the earth. Suppose instead of catching the apple I give it a blow with my hand and send it off fifty feet horizontally, will it reach the ground as soon as if I do not interfere with it? Certainly not, and no sane person would claim such a manifest absurdity. But why not, if the theory be true upon which our philosophy is taught, as above stated?

Suppose the cannon ball is fired from the tower perpendicularly upward, will it reach the common level below as soon as the one

let fall perpendicularly at the same time? Impossible, no teacher would stultify himself before a class of students by teaching such nonsense. But if the above premises be true that the projectile force has no effect upon gravity, and therefore gravity brings the balls to the common level at the same time, why not in one case as well as in another? If in any case an exception to the rule is produced, in this case the premises must be wrong. Again, if instead of being fired directly upward, the ball is fired at an angle of 45 degrees, will it reach the common level as soon as the one let fall perpendicularly? By no means, and no rational man will claim it. But why not, if the above premises are true? Will any teacher of philosophy as laid down in the text-book answer?

The force of projection does modify the force of gravity. When the ball is fired squarely upward, the whole of the projectile force is employed directly to overcome gravity, and does so for a time, all of which time the falling ball is gaining momentum in its descent, which time the other ball never can regain. The ball fired at an angle of 45 degrees will overcome gravity three-fourths as long a time as the other ball, all other things being equal. The one fired at an angle of 90 degrees or horizontally, will overcome gravity one-half as long a time as the one fired straight upward. If the ball is fired at an angle of 45 degrees downward the acceleration caused by the force of projection added to gravity will take it to the level that much quicker than gravity alone. Fired perpendicularly downward, the ball will reach the level as much quicker than the one dropped at the same time as the whole projectile force combined in unison with gravity will accelerate its motion. These propositions are so absolutely self-evident they need no further elucidation.

Any one can demonstrate the truth of the position here taken by the use of two arrows of exactly the same size and weight. Place them so that the rebound from a bent bow or spring will send one away horizontally with all the force of the bow or spring, and drop the other perpendicularly to the ground. The latter will reach the common level while the projected one is still visible in the air on its flight, thus clearly showing to the natural eye the falsity of the theory in the text-books, that the force of projection has no effect on the fall of a body. From these considerations the following rules are deduced:

*In compound action, all forces effect each other in proportion to their respective strength or energy.*

*The fall of a cannon ball or other projectile fired horizontally is retarded in exact proportion to the strength of the force that projects it.*

*Motion is simply the measure of the energy or expenditure of force in any given case.*

If zero of motion and zero of force are one, what a blessing for our railroads to learn this fact; for if the theory be true then when two trains running at a speed of 20, 30, 40, or 50 miles an hour collide and stop motion, what a matter of rejoicing that no damage is done, no property destroyed, no lives lost!

Oskoloosa, Kansas.

# Substantialism as a New Philosophy; and the Christian Standard as a Critic.

BY THE ASSOCIATE EDITOR.

It was no trivial achievement in physical and metaphysical discovery to launch a new philosophy into being at an epoch of intellectual progress so advanced and refined in every thing that goes to make up human civilization and culture, as these closing decades of the nineteenth century.

Had a convention of the wisest philosophers, scientists and metaphysicians of this and all other civilized nations been called twelve years ago to consider the practicability of attempting to spring upon the world an original system of scientific principles, physical laws and natural analogies worthy to be called a new philosophy, the vote, no doubt, would have been unanimous against the feasibility of such attempt.

Especially would this have been the decision in view of the exhaustive research running through the entire present century in every branch of physical, metaphysical and philosophical investigation, supplemented by all the efforts in that direction in past ages, including the phenomenally intellectual epochs in the history of ancient Greece and Rome.

It should be borne in mind that not every embodiment of ideas or formulation of doctrines, in whatever branch of human research, is entitled to the name of a distinctive philosophy. The term philosophy is only justly applicable to a system of principles which when codified form a consistent whole composed of unique elements running through different departments of human thought and investigation; while a new philosophy is only worthy of that designation when such codified system of principles is revolutionary in its tendencies and covers grounds which necessarily overturn views and principles previously considered as settled in similar lines of investigation.

From the standpoint thus taken, it is manifest that very few, even of the systems of doctrine now recognized as the philosophies of the world, would endure the crucial test.

Indeed, when we consult the pages of the classics and carefully survey the more advanced and distinctive philosophical outgivings of those enlightened periods in the world's history, we sometimes marvel at the paucity of original thought upon which were based most of the so-called philosophies of that prolific period. A single assumption, oftentimes without proof, or the merest vagary of a metaphysical dreamer, even without one natural analogy or scientific fact to support it, was considered a sufficient basis for a so-called philosophy, as witness those of the Stoics and the Epicurians, not excepting many of the crudities of Aristotle, Socrates, Democritus and even Plato.

Remembering, however, as we must, the necessarily limited range of general knowledge among the masses at that time, with all sorts of erroneous conceptions of the natural forces and phenomena then prevailing, and shut out as they were from the benefits of books and the universal printing-press of the present age, it is not surprising that an original conception of some favored intellect, however flat a similar conception would fall among the advanced thinkers of to-day, should have startled those masses as a discovery worthy of the gods, and around which every idea of

The length of articles in this number has crowded out several things of importance which will appear next month.

analogous signification should soon have been caused to crystalize into what they dignified as a new philosophy.

Thus has it been to a greater or less degree down to the educational revival that naturally followed the introduction of the printing-press,—the greatest single discovery or invention for the advancement of the race ever made by man.

Since the real influence of that advance began to spread and to be felt in the rapid multiplication of books and in the flooding of the continents with newspaper and magazine literature, by which the knowledge of one became the common property of all, it is not surprising that but very few advance conceptions, even by the most highly gifted intellects, have so far outshone in originality and merit the average attainments of the educated as to form a nucleus around which any sort of a system of principles and laws could crystalize worthy to be called a philosophy.

A few exceptions to the general effect of this universal spread of knowledge might be named, as in the case of Des Cartes and Bacon, but so little did these philosophical nuclei develop that was not before known that it has required all the efforts of their adherents to keep alive what they claimed as original under the garb of any sort of admissible philosophy.

But daring as the statement may seem to those not already informed upon the subject, Substantialism, as a new and revolutionary order of things, about ten or twelve years ago broke the monotony of the centuries, and at a single revolutionary stride ushered into the arena of human thought an original system of scientific principles and natural analogies entirely worthy to be christened—as it has justly been—*The Substantial Philosophy*.

The system of doctrines thus designated was not only new to the world of letters and of scientific research, but it possesses such an original and distinctive individuality in the domain of advanced thought as to make it in a very marked degree revolutionary. The world, in an important sense, was not only ripe for it but was startled by it. The age not only needed it as a culmination of centuries of previous advance along the whole line of scientific, philosophical, and especially physical investigation, but when it came it was so realistic of the necessities of the times that the men who most needed its revelations and most longed for its coming repudiated its teaching and frowned upon its missionaries.

It came unto its own and its own received it not. Those who most had seen the defects of the unsatisfactory motion-theories of the schools which had borne sway since the days of Newton, and who, in their floundering attempts to satisfy the average student, had most keenly felt an aching void for something more rational and reliable, were overwhelmed with the reality of what their own mental foreshadowings had dimly pictured. The very revolutionary character of the scientific overturn which their yearnings had invited, and which they had seen as through a glass darkly, proved to be more than they had bargained for, and, if not too good to be true, was in some of its serious aspects too true to be good, especially for the present established order of things.

No one dared to dispute its revolutionary character, thus conceding to it the very first

and the very broadest element and characteristic of a new philosophy. However they might object to the correctness of its scientific positions, they could not question the sweeping novelty and originality of its philosophical deductions.

It thus stood out in bold relief, while backed by many scientific facts so novel and so worthy in all respects to be regarded as new in philosophy, that they were found in direct conflict with the fundamental principles of physical science as taught in all the colleges of the world.

Surely a system of doctrines, if proved to be true, which so sweepingly antagonizes the teachings of every text-book on physics, and which necessarily involves the discovery of many natural laws, facts and principles previously unknown to science, as is the case with Substantialism, can not for one moment be questioned as worthy of all the honors and emoluments of a new philosophy, even as would a newly-discovered star of the first magnitude in the physical heavens be the just mark of a new astronomical epoch.

While other philosophies have been conceded more by courtesy, out of general respect for their founders than from anything very distinctive or revolutionary in their teachings, and while all previous philosophies have met little opposition from prevailing theories of science owing to their slight divergencies, Substantialism, *sui generis*, and startling in its characteristic individuality, had not one friend at its introduction, because, forsooth, like Esau, its hand was against every man and every man's hand in the scientific and philosophical world seemed against it.

There was, in fact, almost nothing in its revolutionary overturn of the motion-theories of physical science in common with any text-book now published. It not only by a single fiat of inexorable logic had converted every natural force or phenomena-producing cause, even including heat, light and sound, into a substantial entity, but having established this fact by the most invincible arguments known to philosophical polemics, and in the face of all science falsely so-called, it at once proceeded to use these same substantial forces of nature as legitimate and unanswerable analogies in favor of revealed religion.

If every force in nature, including sound, light and heat, were real, substantial though immaterial entities, as this new philosophy claimed to have demonstrated, and by a line of argumentation as original as was the philosophy itself, then it insisted that all force, *per se*, including life-force, mind-force, soul-force, etc., must necessarily also be substantial.

Thus the new philosophy of Substantialism had but an easy task in overturning the materialistic doctrine of life-force, mind-force and spirit-force as modes of motion of brain particles which had been deduced by Haeckel and other German and English atheists from the incontrovertible logic of these very motion-theories of the natural forces as taught in our misguided evangelical colleges.

What philosopher, ancient or modern, ever before struck such a philosophical bonanza or ever before made such a decided and radical departure from the beaten track of previous scientific thought? and what other philosophy, physical or metaphysical, having made any sort of departure, ever before proceeded to



utilize it with telling effect in favor of religion and human immortality as against the atheistic and materialistic tendencies of the age? No such intrinsic evidences of a radically new philosophy can be found in all the records of the past.

When the founder of Substantialism had seen the natural drift and fruits of the teachings of our colleges concerning the physical forces, namely, that the materialists had a logical and legitimate right to seize upon that very teaching to prove the soul but a mode of motion of the brain and nerve-particles, and therefore, that the soul as motion, must necessarily cease to exist at death, he was driven to the conclusion that the clergy of the whole land, by indorsing these motion-theories of the schools, had unwittingly surrendered the church to the tender mercies of Materialism.

It was then that he resolved to cry aloud and spare not. At that moment the Substantial Philosophy was born. It is now about twelve years old, and bids fair to become as strong as it is novel and aggressive. But those most in need of the Substantial Philosophy of any class of men living—the editors of the religious press—appear, as a rule, to be the most incorrigibly prejudiced against its teachings, carrying their opposition even to the very verge of bigotry. Illustrations of this kind have often appeared in the pages of the MICROCOSM. Here is a late specimen clipped from *The Christian Standard*, of Cincinnati, Ohio (in answer to an apparently candid inquiry of one of its readers), which for stupid misapprehension exceeds anything we have recently seen:

"I have just received a copy of a periodical called the MICROCOSM edited by A. Wilford Hall, of New York. The paper is a strong advocate of 'Substantialism.' Would like to know what you think of Mr. Hall's writing, also of the Substantial Philosophy, as I do not quite understand it, having seen only this one copy of the paper. Would you please report in *The Standard*, or at least give us your idea in some way, of the subject? A READER."

"The burden of A. Wilford Hall's message seems to be about this: Sound is a substance. He does not now claim that it is a material substance, though he did formerly. It is a substance after the manner of spiritual existences. He claims that his view adds greatly to the proof of the existence of the spirit apart from the body. We do not believe that sound is a substance; and even if it were proved to be such, it does not appear that the fact would be of any value as an argument for immortality. Sound, whatever it may be, dies out of existence too quick to be of much force as an argument for the existence of things eternal. Besides, if sound is a substantial entity, as is claimed by Mr. Hall, God is not the only Creator; for who can not create sound?" [Ed. of *Standard*.]

We strongly suspect that this "Reader" is a veritable Murchisonian Substantialist, and was only guying the unsophisticated editor to expose his ignorance, and thus to bait him on to step into an open trap, there to be held fast while the MICROCOSM should gobble him up. Let us look for a moment at the way in which he proceeds with his self-exposure: "He does not now claim it [sound] to be material substance, though he did formerly."

This misrepresentation is no doubt willful.

Dr. Hall never claimed any such thing, but has always insisted upon exactly the opposite. In the earliest edition of the "Problem of Human Life," when it was printed in meter, the word *matter* by mistake occurred once or twice instead of *substance*, which was corrected in the prose edition, and has been explained frequently by him since, both in the MICROCOSM and in the *Scientific Arena*. But such explanations are of no use to a man who is perversely bent on doing a cause as much injustice as lies in his power. He says:

"It [sound] is a substance [according to Hall] after the manner of spiritual existences."

This is as false as was the sentence preceding, and shows the limited conception which men, otherwise intelligent, form of the proper classifications of the various substantial entities of the universe.

Though *sound* and *spirit* are both immaterial substances, they belong to very different classes. *Spirit* belongs with the class of mental, vital and psychical forces, while *sound* belongs with the substantial physical forces in which class are light, heat, gravitation, electricity, magnetism, cohesion, etc., all of which are as much involved in the Substantial Philosophy, and as much claimed by the founder of Substantialism to be among the immaterial substances of the universe, as is sound or spirit.

Why, then, does this superficial critic try to make the impression on his innocent(?) inquirer that *sound* is "the burden of A. Wilford Hall's message," and all there is in Substantialism? Some of his subscribers may be shallow enough thus to be hoodwinked, but that "Reader," doubtless, was not one of them.

The editor declares frankly that he "does not believe that sound is a substance." Poor victim of the motion-theories of modern science! Little does he seem to realize that it is this very motion doctrine of sound, light, heat, etc.,—this very denial that these natural forces are anything substantial,—that the advanced Materialists of Europe welcome from just such self-stultified religionists as himself, by which to prove that the *soul* and *spirit*, like *heat* or *sound*, are but modes of motion that "die out of existence" as soon as they cease to be manifested in the flesh!

Plainly, Prof. Haeckel would say to this repudiator of Substantialism, if one of the natural forces or phenomena-producing causes really "dies out of existence" as soon as its manifestations cease, then what proof have you that the forces of life, mind and spirit do not also "die out of existence" as soon as they cease to manifest themselves to our senses?

Such an editor as this oracle of the *Standard* would make so small a bite for the hungry Haeckel, that the Great German Materialist would have to invent a gustatory microscope to be able to taste him.

The last sentence in the above answer to "Reader" is almost too puerile to be worthy of a reply. Does the sagacious editor of that widely-circulated paper suppose that he creates electricity by revolving the dynamo-machine? Or is he capable of conceiving the fact that instead of becoming a *creator*, in competition with the Almighty, he merely, as agent, employs the means appointed in nature for liberating this substantial form of energy from the force-element where God has stored it in abundance for all the wants and necessities of man?

On the contrary, if sound be merely the wave-motion of the air, as the *Standard* editor believes, then, by moving his vocal organs, he actually creates it, since it is he who produces this motion, thus proving on his own ridiculous reasoning that "God is not the only Creator."

It is plain also that every mosquito that moves its wings really creates wave-theory sound, as an atmospheric disturbance, and thus, according to this sapient sage of the *Standard*, sets up opposition to God! But not so with anything that is a Substantial entity like one of the forces of nature. Man can liberate it, or cause it to be manifested, but God alone can create it. But all this probably will fall flat on a mind capable of such reasoning as that answer to "Reader" contains.

To suppose, as does the editor of the *Standard*, that the Chicago cow, when she kicked over the candle which started the great conflagration in that city some years ago, actually "created" all the heat and light liberated from the force-element of nature on that occasion, is just about what we would naturally expect from a journalist who can write the prodigious nonsense he is in the habit of printing in that paper on the subject of Substantialism.

#### Our Pamphlet on Health and Longevity as Announced Last Month.

"Watchman, tell us of the night,  
What the signs of promise are."

Yes, we will tell all the "signs of promise" up to date, and endeavor to make a faithful report to the reader as far as we have gone.

At this writing it is only two weeks since the April MICROCOSM, containing our "Personal Statement," got fairly into circulation. We issued that statement under a good deal of trepidation and personal misgiving, not knowing how it would be received by our very generous readers, but it was the only thing we could do, and, having taken the step, it now becomes our duty to make the best of it.

Up to the present time a very large number of the friends of the MICROCOSM—well on toward a thousand—have sent in requests for the "Pledge of Honor," and the price and conditions upon which the Pamphlet would be sent. To all such we have sent the pledge and a circular of explanation as soon as the letters have been received.

Out of this large number of applicants for the pledge, however, only a very few have so far deemed it wise or prudent to send for the pamphlet, and most of these have at the same time protested that they thus act in a line contrary to their usual business habits, adding in a complimentary way that their unbounded confidence in the judgment and veracity of the editor of the MICROCOSM is alone what induces them to take the risk.

This risk, we now frankly state to the readers of the MICROCOSM, consists of \$4.00, the price, as we have carefully calculated, at which we would have been obliged to sell our large book by mail, had we been able to publish it, as at first contemplated. The Preface to that book will be found complete in this number of the MICROCOSM, so the reader can form a judgment concerning it.

The work thus contemplated would have contained about 500 pages, with numerous anatomical illustrations, one of which appears in the pamphlet, showing the entire alimentary canal, with detailed explanations of the same.

Now, had that book been published and announced in the MICROCOSM to be sent by mail on receipt of \$4.00, it would have been precisely the same risk as it is now, to send for the same instruction contained in our confidential pamphlet, and would just as much have been buying a "pig in a poke," as one of our subscribers expresses it.

This pamphlet of 82 pages contains in a condensed form absolutely the same instructions concerning the new treatment, and the rationale of its practice and benefits, as the book would have contained had it been published; and, being in a condensed form, it enables a person who simply wants it for that purpose, to master its contents in two or three hours, instead of wading through a 500-page volume.

It is plainly manifest, from letters received at this office, in reply to the Pledge and explanatory circular, that many of our subscribers regard the price too high considering the size of the pamphlet. Yet several who have received the pamphlet, and have read it, take quite a different view of the subject. One man writes:

"I paid a few weeks ago, and without regarding it as exorbitant, \$4.00 to a doctor for writing out two prescriptions, and they were not the one hundredth part as large as this pamphlet, while the intrinsic value of the instruction they contained was still less in proportion. I am more than satisfied with my investment in the purchase of your confidential pamphlet."

The truth is, it will be exceedingly difficult for us to satisfy those who judge of the value of a document, conveying important information, by the amount of paper, ink and binding it consists of.

Should a man in a single page of note paper offer to tell you, for \$1,000, where you could locate a gold mine worth a million, you would regard it as a great bargain, provided you had entire confidence in his statement; and you would hardly stop to haggle with him about the price because the information was not communicated in a larger document.

Such, at least to some extent, is the nature of the case in hand. If a small pamphlet will reveal to you the information how to save the cost of all future doctor's bills, amounting possibly to hundreds of dollars, as also the losses and suffering resulting from unnecessary sickness, you should hardly hesitate, on account of the \$4.00 charged, because it did not contain 500 instead of 82 pages.

But one subscriber, to whom we have just referred, writes: "It is all very well, and the price is no objection, if we could only know before purchasing the pamphlet, that the information it contains would really be worth the \$4.00. We do not like buying a pig in a poke," etc.

Now all this is quite natural and by no means reprehensible in a strictly business man. But the very subscriber who makes this telling point against purchasing our confidential pamphlet before he has examined it, would, if sick, send for a doctor at a cost of \$4.00, and swallow whatever medicine he would dose out to him, without the slightest knowledge of what he was taking or as to how it was expected to operate. There would be no discussion concerning the price charged, because the medicine did not happen to weigh half a pound instead of five grains; nor would the patient decline to swallow it because he did

not first have a full explanation of its chemical constituents, on the plea of his business scruples against "buying a pig in a poke." And should the doctor, instead of giving him the medicine himself, write out a prescription to be filled at the drug-store, our patient would hardly refuse to send for it because he could not understand a word of its therapeutical gibberish; nor would he reject the trifling slip of paper, with its Latin quail-tracks, because it was not a folio of plainly written manuscript, as big as a servant could carry.

So you see there is a good deal of go-it-blind business all the way through life, even outside of our little physiological pig in its very trifling 32-page poke, on the general motto: "Nothing venture, nothing win."

But then, says our patient, "I have confidence in our doctor as an educated and skillful physician, and am willing to go it blind on the strength of his judgment."

This is certainly noble, and about the only redeeming feature in humanity there is left, namely, confidence in our fellow beings. Without this, business as well as social relationships would be at an end. We would not even dare to buy a pair of boots unless the merchant would first let us wear them out to prove their quality, lest their soles should be made of paper, and should thus prove another "pig in a poke."

Confidence in our own word and judgment, by our fellows, is what we have assiduously been laboring to earn for these dozen years, and we feel very grateful to know that we have not been swindled out of our earnings.

We have invariably advised every one who has expressed the slightest hesitation about sending for our confidential instruction to wait till some neighbor or friend, known to be truthful, shall have purchased the pamphlet and demonstrated its value. That time, we think, in the nature of the case, will not be long delayed, as we conscientiously regard the instruction we are offering to the world as the *leaven put into the three measures of meal*.

The Rev. Dr. James A. Buck, the venerable Episcopal clergyman of Washington City, and Chaplain of the Soldiers' Home, now about 78 years old, writes us: "I use your treatment every second night before retiring, and have already derived so much benefit and comfort from it that I yearn for bed time to come. What can I do to help forward the good work of bringing this discovery into notice? Let me know. JAS. A. BUCK."

#### Petrifications.

BY REV. J. M. JAMISON, D. D.

Dear Dr. Hall:

I have just read your article on *Petrifications* in the *Microcosm*.

The processes of nature are sometimes very mysterious. I once assisted in examining an ancient stone building, on a high bluff of the Mississippi, in which we found human bones. I placed a part of the bone of the leg upon the stone wall. The osseous part soon sloughed off and left the marrow exposed, which was completely petrified. How this could have occurred inside of the bone is a mystery.

I once saw at St. Genevieve, on the Mississippi River, a petrified toad, in the family of Hon. L. F. Linn. It was picked up in a prairie, on the surface of the ground. It was as perfect

as in life. The color, the spots on the skin, the eyes, the open mouth, and the tongue in the mouth, all complete. It was just in the attitude of jumping. No decay.

But the most remarkable instance of petrification which I ever saw, was at Herculaneum, on the Mississippi River. Dr. Cooley had conducted the water from a spring, some hundred yards or more, in small wooden troughs to his house for domestic purposes. Beautiful green moss had formed in the little troughs, and hung in pendants to the ground. But that green moss, as it hung from those little troughs, was changed into stone, retaining all its original appearance of green moss. There the process of petrification was going on daily, but by what law, who can tell, and what was the agent employed? These cases seem to disprove the common theory of displacement. If the change was produced by the water, its elements could be ascertained by analyzing it.

Whether the little troughs or the mosses are there or not, the spring is, no doubt, there still.

Los Angeles, Cal.

#### Dr. Wilford Hall's Scientific Library.

[From the Arena.]

"The principles of the Substantial Philosophy, with their collateral bearings, which are unfolded in Dr. Hall's writings, have cost him more than ten years of unremitting labor, such as few men besides himself have ever performed. The results of this tireless scientific and philosophical research, as therein elaborated and set forth, can be found in no other library of books on earth; and those who fall of the present opportunity to secure these unique works, at the trifling cost proposed by his publishers, will realize a missing link in their chain of knowledge, which they may always regret and may never be able to supply."

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Remember also that a Sample Copy will be mailed free to any friend whose name shall be sent to us for the purpose.

This number completes the 1st half of Vol. VI.



# The Microcosm

A MONTHLY JOURNAL OF SUBSTANTIALISM AND COLLATERAL DISCUSSIONS.

THE ORGAN OF THE SUBSTANTIAL PHILOSOPHY.

A. WILFORD HALL, Ph. D., LL. D., Editor and Proprietor.

(Author of the "Problem of Human Life," "Universalism Against Itself," Editor of the *Scientific Arena*, &c., &c.)

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Address all communications to A. WILFORD HALL, 23 Park Row, New York.

Vol. VI.—No. 7.

JUNE, 1889.

50 Cents a Year.

Entered as second class matter at the New York Post Office.

## THEOSOPHY AS EXPOUNDED BY ITS HEAD.

BY THE EDITOR.

For the first time in our life we had the pleasure of a full exposition of the principles of Theosophy a few evenings since at Cartier's Hall in this city. The lecturer was no less a personage than the distinguished Prof. Elliott Coues of the Smithsonian Institute, Washington, D.C., and the President of the Theosophical Society of America. Prof. Coues is admittedly the head of Theosophy in this country, and it is said has reached the highest degree in the mysteries and arts of that occult system of eastern metaphysical and psychical thought.

We received a very courteous letter from Dr. Coues from Washington, inclosing a ticket of admission to his lecture, and an invitation to be present, which we gladly accepted, and now tender our thanks to the Doctor for the pleasure and information we received.

A large audience of distinguished appearing ladies and gentleman filled the hall till there was not even standing room, many having to go away. The lecture lasted for an hour and a half, during which all present were riveted with the closest attention.

The subject announced was "Modern Miracles," but it really appeared more like a text or starting point for the real theme of the discourse than the subject matter of the lecture itself. Indeed, the professor said but little about miracles, and what he did say was anything but satisfactory or instructive.

Miracles he insisted, were simply *mysteries*; and that which was a miracle to one person, was often a very ordinary thing or event to another. To many persons—those who do not comprehend it—the telephone is a miracle, said he, just as the steam engine, the lucifer match, and the running of a watch are miracles to the savages of the north-west.

Now all this is absurd as anything like a genuine or correct definition of miracles. It is true that a miracle is a mystery but all mysteries are by no means miracles. This very weak attempt to fritter away miracles or reduce them to the every-day affairs of life, because to ignorant persons many such affairs were not understood, gave a bad, very bad first impression of Theosophy to our mind.

Not a single conception of the real nature of a miracle did the Doctor advance, such as a super-mundane fact or occurrence by a super-

human agency. Indeed, the entire drift of his discussion was to deny and even to ridicule the very idea or possibility of miracles in the Scripture sense of the term as a special act or interposition on the part of a Supreme Being. In this vein he made many allusions to the miracles wrought by Christ, and even intimated that if the truth were known Lazarus was "not quite dead" when he was commanded to come forth.

However much he denied and derided the fact of miracles in the ordinary acceptation, either ancient or modern, he stated emphatically that he believed in *ghosts*, both ancient and modern, and although he regarded such spiritual apparitions as ordinary occurrences, they were, nevertheless, miracles to the ignorant or uninitiated. On this modern ghost question he said he was so orthodox that he believed that the grave-yards were full of ghosts, and that most of the stories of such apparitions having been seen in lonely places where great crimes had been committed were no doubt genuine ghost adventures.

He said that he himself was a ghost, and possessed a ghost-organism, which was his astral body, according to theosophy, inside of his physical structure. That this astral body was not only capable of separate visible materialization while the material body was living, but that it was the same real ghost that was often seen by persons of intensified psychical vision after such spiritual entity had left its fleshly habitation at death.

He claimed that the appearance of such ghosts was vastly more common than most people supposed, and that any one advanced in occultism could project his astral body to any distance, so as to make itself visible and tangible to persons of sufficient psychic culture.

He even came right out frankly and declared that he himself was able to project his astral body miles away from his corporeal structure, so that advanced theosophists could see him, feel him, hear him and carry on conversation with him, while he himself, or his physical personality, would be engaged in similar conversation elsewhere.

Of course we were given to understand, that while he was then lecturing to us in that hall he could project his astral body to Washington City and commune with friends there who could see and recognize him. Manifestly this beats modern spiritualism which seems to deal almost if not entirely with the spirits of departed friends.

Now we should have liked to ask the Doctor to tell us of what special use his astral body

could be to his present personal existence, if he could go on with his lecture as he was then doing while his astral body or psychic ego was in Washington City? Plainly, if he can get along all right in one place, both physically and intellectually, while his astral body is projected to another place, we fail to see why this much talked of astral organism might not be dispensed with altogether.

We have always understood this psychic organism to be the *soul*, whether projected or not. And if a man can dispense with his soul for an hour and still live, why not entirely?

The Doctor referred several times to his astral body as his "double." But instead of a *double*, he must have at least three separate organic entities and personalities in his one being, since his physical and intellectual organisms are surely essential to a popular lecture such as he was delivering, while his astral body could be engaged in projecting itself to distant cities. Why then call it a "double?"

We thought, while the Doctor was thus insisting upon the possibility of projecting his astral body, how cheap is mere talk, and how much better would have been a practical demonstration, especially when the thing was apparently so easy? How readily, for example, the Doctor could have convinced all present of the truth of Theosophy by projecting his astral body out among his auditors while going on with his lecture in his proper person upon the platform!

Should he claim that we would not have been able to see such a body without the astral eyes necessary, still, that would not have prevented the demonstration, since there were many of the advanced and cultured members of the Theosophical Society scattered through the assembly, some of whom we knew. If the Doctor had given such a demonstration as we suggest, we would gladly have taken the personal testimony of such intelligent gentlemen and ladies, at least as corroborative proof of Theosophy, had we seen them shaking hands with the astral body of the Doctor, even though that body itself we would not have been able to see.

It is reported that Madame Blavatsky, the most distinguished Theosophist of Europe, is a bitter enemy of the Spiritualists of modern times, regarding them as fraudulent imitators of the genuine astral phenomena of Theosophy. In fact, Dr. Coues breathed a similar spirit in his covert ridicule of the "Commercial Sec\* of Modern Spiritualism," as he termed it.

But now we assert that with all the disparagement of our mediumistic friends by these great Theosophical lights we decidedly prefer Spiritualism, since for a couple of dollars or so its representatives will exhibit even to vulgar eyes on favorable occasions the materialized forms of veritable ghosts or departed spirits, which are exactly the same in substance as Dr. Coues' astral body, since the lecturer admitted very frankly that these mediumistic materializations exhibited at *seances*, though generally manufactured to order, sometimes represented actual and genuine psychic organisms.

The truth is, the Spiritualists have a much broader, more varied and comprehensive conception of the relations existing between the spirit and the body, and of the hereafter of psychic existence, than have Theosophists, taking Dr. Coues as their authorized representative and exponent. Judging from his exposition Theosophy has only one prominent article

of faith, and that is that every human being possesses an astral body whose principal occupation is to project itself. And even though this employment might prove very beneficial to ultra-materialists, and especially useful in convincing unbelievers of the truth of the occult science, yet the Doctor failed entirely to take advantage of this important occasion to utilize his only tangible article of faith and thus do a little demonstrative projecting of his astral body.

Had he done this, even supposing the vulgar herd had not been able to see his magnificent physique, or rather psychique, gliding noiselessly among his auditors, yet the fact that his numerous theosophical friends could have so recognized him with their psychic eyes, and so certified and reported in the daily papers, would have done more to arouse an interest in Theosophy in this community, and to convince the world of the truth of the occult doctrine than all the expensive trips he ever took or ever will take to Egypt and India.

Indeed, one such opportune projection of his astral body would have gone further in proselyting the unbelievers of New York and vicinity than a dozen gunny-bags full of chips knocked off the dingy corners of the mystic crypts and symbolic galleries of old Cheops, several powerful fragments of which, as he hinted, he carried about his person, but which for prudential reasons he was not permitted to exhibit.

What a pity, therefore, that the distinguished President of the Theosophical Society of America had not risen to the importance of the occasion, and with one centennial projection of his astral body have convinced New York of the great fundamental truth of Eastern Occultism!

Spiritual mediums never have such grand opportunities since their materializations, not being under their own control, sometimes fail to make connection at the critical point, not from any fault of their own, but owing to the disgruntled spirits, taking umbrage at the presence of some unbeliever, in disgust hying themselves away to the vasty deep and refusing to materialize, notwithstanding the coaxing appeals of the disappointed medium and the worse disappointed assemblage. Not so, however, with Prof. Coues. His astral body is his own, and has no right to refuse to project when he commands it to do so. That it did not project itself, or in other words, that the Doctor did not voluntarily project his "double," and thus prove the truth of Theosophy on an occasion so auspicious, can only be accounted for by the fact that he don't want his philosophy to become known, or else that his much talked-of projecting astral body is a humbug.

Though the Doctor ridiculed Spiritualism he admitted the truth of clairvoyance, but claimed it as a legitimate adjunct of Theosophy lately appropriated by mediumistic adventurers. He gave as a proof of the truth of clairvoyance the fact that persons having their astral eyes well-developed could read a sealed letter or newspaper article held against the back of the head or even against the "pit of the stomach!" A singular place for eyes, to say the least, unless one were looking for a beef-steak, for example.

The Doctor, being a scientific lecturer, could not resist the temptation to give us a touch of his knowledge of the physical laws, at least by way of illustration. He said, "as light consists of the vibrations of ether, and sound con-

sists of the vibrations of air, so the clairvoyant can set into vibration, the psychic aura, whatever that is, possibly the astral atmosphere, and project these vibrations to great distances which will even repeat themselves in an instrument of wonderful power called the *audiphone* that can be heard there the same as we can hear a message over a telephone wire, etc."

While the professor thus proved himself to be all at sea on the motion-theories of science, and as bad as the worst advocate of heat as a mode of motion, we are free to confess that he advanced many ideas antagonistic to those notions and in harmony with those of the Substantial Philosophy, as for instance, when he insisted upon a substantial psychic organism in every human being of the exact form of the material structure, had he only less frequently referred to the everlasting and persistent idea of its "projection."

But when he came to its illustration by the principles of modern science, as above set forth, he completely put his astral foot in it by giving us a fair demonstration, *a la* Hæckel, that this psychic body after all is only a metaphysical mode of motion, no better for projecting purposes than a puff of smoke from Prof. Tyndall's "brown paper." For plainly, if the forces of nature,—such as sound, light, heat, etc.,—are but vibrations of matter, then the man must be shallow indeed who can not see the pungency and irresistible character of Hæckel's reasoning by which he shows that the soul, like sound, is also a mode of motion of brain particles, and instead of being an astral body or any other substantial thing must be dissipated out of existence like all other modes of motion as soon as the vibrating matter comes to rest.

But Dr. Coues, in blissful ignorance of his danger and of where his motion-theories of science were leading him, never once dreamt of the absolute necessity of calling to his aid the Substantial Philosophy and its arguments on the natural analogy of the physical forces as substantial entities, in order to back up, reinforce, and maintain his astral body or psychic organism as a substantial entity. How easily and conclusively Substantialism would help him and Madame Blavatsky out of their trouble with materialism if they could only be made to see it, and would only accept its assistance!

Dr. Coues, as we are informed, is just again starting for Egypt and India on some sort of a secret mission, of course in the interest of Theosophical propagandism under the auspices of the Theosophical Society of America, and in co-operation with Madame Blavatsky.

They are also in their eastern enterprise patronized by the wealth and social influence of many distinguished persons, including the Countess Wachtmeister, of England, the Countess Caithness, and the Dutchess de Madina Pomar, of Paris, who are among the leading theosophists of Europe.

But we say to these great philosophical and theosophical lights, with all their occultism and astral logic, unless they at once call to their aid the principles of Substantialism for abetting the doctrine of the psychic and substantial organism of man by the invincible analogies of nature and true science, that Hæckel, or any other bright materialist, should he chance to meet them in their pilgrimage to India, could with his thumb-nail crush the life out of their entire theosophical assumption of an astral body. So they had better prepare themselves

by laying in a good stock of substantial ammunition before they start.

At the close of his lecture the Doctor encouraged his theosophical brethren and sisters present not to fear for the permanency of these occult principles, because in numberless sequestered and hidden temples of India the most distinguished alchemists, seers and Rosacrucians of the ancient faith were now standing guard night and day by turns, that no uninitiated and vulgar eye should spy out the secrets and sacred mysteries of their ancient order, through which from time immemorial the mystical tripod, with its perpetually boiling alembics, has been transmitted from age to age as it will be for all coming time.

But we say to the initiated and to all others, if the secrets thus kept and guarded so persistently are of no more real value to the world, and no better calculated to meet the arguments of materialism against the immortality of the soul than were the principles enunciated from the platform of Cartier Hall, the world will lose very little if some sacrilegious iconoclast should steal into their most sacred temple and with his vulgar club smash their tripod and overturn their alembics.

#### Natural Selection and Survival of the Fittest.

BY REV. JOHN CRAWFORD, D. D.

There is no error so deceptive to superficial minds as that which has underneath it a thin substratum of truth. I believe there is a portion of truth in Darwin's doctrine of "natural selection" and "survival of the fittest;" but not such an absurd measure as he and his followers maintain.

God, in his infinite wisdom and beneficence, has so arranged that the various species, both of the animal and vegetable kingdoms, have in them a certain amount of elasticity, which enables them to adjust themselves to limited changes, both of climate and surroundings; but never to such an extent as to convert one species into another. Their elasticity may admit of new varieties, but never of new species.

Place a tribe of men in a North temperate climate, where winters must be provided for, nourishing food procured, warm clothing and comfortable homes obtained. Now these men must work or perish. Under these circumstances, a large proportion of the naturally weak and indolent will drop off in infancy and youth, leaving few or no descendants, while the naturally robust and energetic will survive, and leave a large posterity.

Let this weeding-out of the weak and unfit go on from generation to generation, and you will, as the result, have a race of men, vigorous, both in mind and body, against whom their tropical neighbors will not be able to contend, either in arms, science, manufacturing or trade. Hence, the most civilized and ruling nations have ever been found in the temperate zone.

Again, place the same tribe in a tropical and malarial district, and a large proportion of them would be constitutionally unfitted to the situation, and would die off in early life, leaving few offspring; whereas those, whose constitutions were better adapted to the place, would survive and multiply their kind, until a race would be produced, fully adapted to their various surroundings.



Breeders of animals and cultivators of plants, by taking advantage of occasional or accidental variations, have formed and perpetuated new varieties; but no ingenuity of man has ever succeeded in originating a new species! God allows man to produce, by careful management, such varieties as are best adapted to his wants and tastes; thus rewarding his diligence and skill; but, in order to prevent confusion, he has set up an impassable barrier between species.

In a few instances, man may cross two species; but a hybrid is the result, and here he must stop. In a very few rare cases, I admit, hybrids have been found fertile; but these might be counted on the fingers of one hand. Nor are these hybrids fertile among themselves, so as to originate a new species, but only with those of one or other of their progenitors, and so merge into either species from which they sprung.

In thus placing an impassable barrier, in order to prevent confusion, and yet with a certain amount of flexibility within each species, so as to enable it to adapt itself to its varied surroundings, and also to reward the care of man, may we not see, and admire, the wisdom and benevolence of the Creator?

That man can have little of the philosopher but the cloak and staff, who is incapable of admiring the wisdom and goodness of God, in definitely dividing into their distinct genera and species his vast animal and vegetable kingdoms of nature, for the aid and convenience of his rational creature man in making a classification of the works of their great Creator. What man could attempt any classification, if such a hopeless confusion prevailed, as is implied in the system of Darwin and the evolution scientists?

Evolutionists, new-fangled with their obvious discovery, have carried it beyond all rational bounds? To their extravagant hypothesis there are at least three insuperable objections. It has not a particle of reliable proof, and is founded on nothing but wild and unscientific conjecture! It is derogatory to the wisdom of God, who is not the author of confusion, but of order! It is in direct contradiction to God's inspired word. If I admitted the truth of evolution, even theistic evolution, I would be under the necessity of abandoning inspiration, as I possess no faculty for reconciling such contradictions!

Such men as Darwin, Huxley and Hæckel are mere experts in their own departments; but it is rare, indeed, to find an expert who is also a philosopher. The philosopher is a man of a superior order. Experts can seldom look beyond the bounds of their own narrow sphere without being dazzled; and yet, it is not uncommon, with this class of men, to assume that they alone are entitled to decide scientific questions. We might as reasonably affirm that the men who dressed the stones, or made the bricks, for St. Paul's Cathedral were better architects than Sir Christopher Wren!

I shall conclude this article with a quotation from Sir J. W. Dawson, on *Specialists*:

"Under the influence of a few men of commanding genius, belonging to the generation now passing away, it [geology] has made so gigantic conquests that its armies have broken up into bands of specialists, little better than scientific banditti, liable to be beaten in detail, and prone to commit outrages on common sense and good taste, which bring their other-

wise good cause into disrepute. The leaders of these bands are, many of them, good soldiers, but few of them fitted to be general officers; and none of them able to reunite our scattered detachments. We need larger minds, and broader culture, and wider sympathies, to organize and rule the lands which we have subdued, and to lead on to further conquests." (Earth and Man.)

St. Thomas, Dakota.

#### FORCE AND MOTION, No. III.

BY REV. J. W. ROBERTS, F. S. SC.

In all cases of a falling body, where gravity and a projectile force are brought into compound action, the momentum of the falling body must be taken into the account. If the two cannon balls of equal size and weight start on their journey at the same time, the one directly to the earth, the other hurled with great force horizontally, the first will gain in momentum of fall all the time the other is retarded by the projectile force, and this gain is continually multiplied to the end of the fall. Suppose the difference in time of reaching the common level is three seconds from a given height; if there was no gain in momentum then this difference would be the same from any height. But as the gain in momentum is in inverse ratio to the square of the distance through which the body falls, it becomes an important factor in the problem to be solved, and the height of the tower is as essential to the determining of the time as any other condition of the experiment. It would be as reasonable and as possible to determine the length of the shadow of the tower at noon without knowing its altitude, by mathematical methods, as to settle the time in the other case without knowing the altitude of the tower. Hence the proposition in the text-books relative to the fall of bodies is incomplete, because it is based on an essential error.

Of course, the most nicely adjusted instruments, and the acutest mathematical calculations will be required to determine with exactness the difference of time required between the reaching of the common level of the two cannon balls in question; for in the fall through the same distance, the one having the advantage in start not only holds that advantage to the end, but holds it with its perpetual gain by acceleration of fall which the other can not regain or overtake.

From what has already been said in these papers (and facts and illustrations can be multiplied indefinitely), it is clearly evident that *in all cases of compound action of forces the simple action of the same forces is modified so as to increase or diminish results*, accordingly as the forces act in conjunction and co-operative harmony, or in direct or partial opposition one to the other; and it makes no difference whether one of these forces be gravity or otherwise.

If it be true that "projectile force has no effect on gravity," why does not gravity stop a cannon ball at once when a force starts it to rolling on a table or other smooth, hard surface? Will our text-book authors tell us why it rolls, and why the rolling continues in exact proportion to the projectile force employed, notwithstanding gravity pulls it just as vigorously when in motion as when at rest, or, on a perpendicular fall? If the "projectile force has no effect on gravity," the ball should not move a hair's breadth, though all the dynamite in the world should be applied to it. Is not

that a plain proposition which even a child can understand?

Why does a cannon ball move further on a smooth, hard surface, than on a smooth soft one? Because the force of projection brings into action the force of elasticity in the hard surface which it does not to the same degree in the soft surface; and the two forces acting in conjunction must, of course, produce greater results. How simple and easily understood is truth!

As motion itself, as well as its mode, is the creature of force in all cases and to the utmost limit, what part does it perform in dynamics? Is it anything in the universal economy of Nature (or mechanics) but an index to measure the amount of force necessary to produce it?

Oskaloosa, Kansas.

### PROJECTION AND GRAVITY.

BY THE EDITOR.

In the April number, at the beginning of the series of papers by Dr. Roberts on "Force and Motion" here closed, we promised our readers something new on the problem of the combined falling and projection of cannon balls therein discussed. We now attempt to redeem that promise.

It is true, as quoted by Dr. Roberts, that the text-books of natural philosophy lay it down as a definite and settled law of physical science, that a ball projected from a cannon horizontally from the top of a tower over a level plain, will strike the ground at the same instant as a similar ball simultaneously dropped perpendicularly from the same height.

This law is recklessly or at least carelessly given in the books without the slightest qualification as to the force with which the ball is projected,—whether the powder shall be of sufficient strength or quantity to carry the ball one hundred feet or five miles from the base of the tower before it shall strike the earth.

We now assert that on the condition involved in the distinction here named, depends the true solution of the problem in question; and this condition, with its bearing on the solution, having never been discussed in any book or treatise, so far as we have seen, will present to the reader the new scientific features of the investigation promised in April.

To have neglected this factor of the force of projection, was, as we shall attempt to show, to neglect the essential features of a true solution, and in fact the only difficulty there really is in the problem.

Formerly, in our discussions of this question in the *MICROCOSM*, we entirely overlooked the factor here referred to, and although we reached the correct conclusion, namely, that the ball dropped vertically from the mouth of the cannon would reach the ground first, we failed to give the true reasons therefor solely by neglecting the factor we have referred to, namely, the force of projection and what naturally grows out of it.

While we now approach the subject more carefully than ever before, the scientific reader will please divest his mind, as much as possible, of all he has previously thought on the subject, at least till he shall have weighed our facts and conclusions.

First let us illustrate: Suppose the tower to be 64 feet high; it is known that a cannon ball dropped perpendicularly will reach the ground in two seconds, or very nearly, not

counting the resistance of the air; but fired horizontally, with a force sufficient to reach a distance of a mile before striking the level ground, it will consume more than double the time or between four and five seconds. If this is disputed, let any one fire a rifle bullet horizontally in the same way over a still pond, with sufficient powder to carry it a mile, and from an elevation of 64 feet, and mark its time of flight before reaching the water. Thus a fact easily within the reach of any gunner will demonstrate that for some cause the horizontally projected ball, under the conditions named, will consume more time in reaching the ground than would a similar ball dropped vertically.

If, however, instead of powder sufficient to carry the ball a mile, it should be increased in quantity so as to carry it two miles, its time of reaching the level (64 feet fall) would also be considerably increased, possibly to six or seven seconds. This can also be proved by rifle practice from an elevation over still water, and by gauging the quantity of powder for different distances. It will be found in every horizontal test from a given elevation, that the increase of distance reached will correspond with an increase of the time required to reach it. The reason for these differing results we will now endeavor to explain, and without conflict with natural law.

First, we confess that we have become fully convinced, directly the reverse of our former conclusion, showing how easy it is to be mistaken, that the force given to a horizontally projected ball takes absolutely nothing from the vertical pull of gravity, nor would such horizontal projection detract one particle from the rate of gravital fall in the projected body could the experiment be made in a *vacuum*. In other words, we now believe that but for the resistance of the air, never before properly taken into the account, a cannon ball fired horizontally over a flat surface of ground from any given height, would not only reach the ground as quickly as if dropped vertically, *but very much more quickly*, for reasons which we shall give after a little.

A fact which no writer seems previously to have observed is, that the cannon ball, fired horizontally, in traveling a mile from a tower sixty-four feet high before reaching the ground, *actually has to pass through more than eighty times the amount of atmosphere encountered by the ball which falls perpendicularly sixty-four feet.*

It is the same as letting the ball drop vertically through a tube into which had been pumped eighty additional atmospheres; for this is exactly the aggregate atmospheric resistance the projected ball would have to encounter and overcome in going a mile; and thus we have the true cause of its delay in reaching the ground, since it is perfectly plain from approximate calculation that the ball, falling vertically through a tube containing eighty additional atmospheres, would consume about twice as much time in falling as it does in passing through a single atmosphere as in ordinary experiments.

How simple and plain, then, is the reason why the ball, if projected with sufficiently increased force to carry it two miles instead of one, should consume more time in reaching the level ground;—it is because it has to plow through and displace more atmosphere, and is thereby retarded in its velocity, just as its

competitor falling vertically would be retarded if another 80 atmospheres be pumped into the tube.

But instead of projecting the ball from the cannon with force enough to carry it a mile before reaching the 64 feet level, suppose its projectile force was only sufficient to carry it 100 feet from the vertical base of the tower. It is manifest that there would be but a very slight difference between the falling of the two balls, simply because the greater quantity of atmosphere to be displaced by the projected ball is only inconsiderable.

Because observation has recently shown that the horizontally projected ball actually takes longer to reach a given level than a ball dropped perpendicularly, writers, like ourself for example, have sought superficially and erroneously to show that the projectile force given to the ball horizontally must in some way tend to neutralize the pull of gravity downward, and thus to detract from the vertical velocity of the projected ball. Thus in trying to explain a fact of observation we have all with one accord been led into direct conflict with the natural law of the inviolate relation between two forces when acting at right angles upon a body, as in this case of gravity and projection.

It is perfectly plain to us now that this law of nature and this principle of mechanics, as set forth in all the text-books, can not be overturned or interfered with, and hence that any observed fact which seems to conflict with it, as in our cannon-ball illustration, must be explained by other causes. And what more palpable and self-evident cause than the one we have given, can be assigned for the vertically falling ball reaching the earth quicker than one fired horizontally a mile, namely, that the dropped ball has but one 80th the aggregate amount of atmospheric resistance that the other one has to overcome?

It is clear, if a sufficient number of atmospheres should be pumped into a tube, that a cork ball would float in it as a toy balloon floats in a single air of a room. In such a dense atmosphere it is evident that the fall of a piece of iron would be sensibly retarded, somewhat as lead is retarded in falling through water.

But the reason here given for the difference in time of the two cannon balls reaching the ground, namely, the difference in the quantity of atmosphere the two balls have to displace, is by no means the only reason for this disparity in their time of falling. In addition to the cause of this retardation of the horizontally projected ball, we have the fact of the greatly increased resistance of the air itself, in consequence of the greater velocity of contact of the projected ball, it being 80 times greater than that of the one dropped.

To prove this principle we have only to observe the effect of the explosion of a quantity of nitro-glycerine placed on a flat rock. So great is the velocity of its action, and so correspondingly great is the resistance of the air above it consequent upon such velocity, that the rock is crushed by the downward explosion. Rifle powder which acts on precisely the same principle, but more tardily, produces no observed effect on the rock because its expansive action is at so much less velocity that the air has time to get out of the way without opposing more than a slight resistance.

From this line of reasoning we are led at

once to the conclusion that the law of the acceleration of falling bodies, as laid down in the books, is widely wrong in consequence of scientists taking no adequate account of this important factor of *increasing atmospheric resistance in proportion to increasing velocity in accelerated fall.*

Writers have estimated that the accelerated velocity of a bullet falling from a height of several miles, on reaching the earth, would vastly surpass that of a bullet fired from a rifle. This would be true if the increase in velocity should strictly be in accordance with the law of acceleration. But the factor of atmospheric resistance, increasing in exact proportion to increased velocity, totally overturns this calculation, and must in the nature of such resistance soon neutralize entirely all acceleration in the falling bullet,—possibly before it shall have fallen a single mile.

A bullet fired from a rifle vertically downward from a great height, say six or eight miles, would manifestly soon lose all its projectile velocity by the resistance of the air, as well as all its acceleration for the same reason, reaching the ground at the ordinary velocity of a bullet dropped from a balloon, with its increasing acceleration entirely checked by atmospheric resistance.

This is beautifully illustrated by firing a bullet vertically downward into the denser medium *water*. It will only penetrate a few inches by the projectile force of the powder, and then, without either acceleration or projection, continue to fall at a regular speed proportioned to the specific gravity of the bullet as compared to that of the water.

Thus we reach the absolute conclusion that the law of acceleration of falling bodies can only hold good even theoretically in a vacuum, while practically in our atmosphere it can be only approximately correct even for infinitesimal distances, all because the increased resistance of the air in proportion to increased velocity has never been taken into account by physicists.

The books teach flatly that a stone will fall 16 feet the first second; 48 feet the next; 80 feet the next; 112 feet the next, and so on, till a stone falling from the clouds would have many times the velocity of a cannon ball. Some writers, it is true, have made a slight deduction for atmospheric resistance, but no one, so far as we have read, has ever intimated the fact that this increased resistance from increasing velocity must soon stop all acceleration, *thus allowing the stone to continue at a uniform speed, the factor of resistance exactly neutralizing the tendency to acceleration.*

A meteoric stone may enter our air with such velocity as not only to heat it to incandescence by friction, but actually to crush it to fragments, thus showing that the air is a factor of resistance hitherto very improperly estimated.

We stated a moment ago that a cannon ball fired horizontally from any height, so far from neutralizing any portion of gravital pull by cutting it at right angles, would actually reach the level quicker than the ball dropped vertically from the mouth of the cannon, except for the resistance of the air; and this would be true whatever amount of force should be applied to the projected ball—even if enough to carry it five miles away.

The reason for this assumption is the simple



fact that instantly on leaving the mouth of the cannon the horizontal direction of the ball is changed by the pull of gravity to a diagonal direction downward, thus actually adding a portion of the projectile force of the powder to that of gravity in bringing this ball toward the ground; and this change toward verticality in the projected ball constantly increases with its flight, thus continually, more and more, aiding the pull of gravity by the projectile force of the powder till the ball strikes the ground.

It is perfectly plain if the ball should be fired even in the slightest degree below the horizontal line, the tendency would be to aid gravity just to that extent by the projectile force of the powder in bringing the ball to the ground, and thus to outstrip the one dropped vertically, which it would most certainly accomplish, whatever distance projected, but for the resistance of the air.

Then it requires but very little intellect to see that gravity is actually thus assisted when the ball is fired horizontally, *since it does not travel one inch from the mouth of the cannon before changing from a horizontal to a partially vertical direction downward, and which increases more and more, thus more and more as it advances, aiding gravity to bring it to the ground.*

Thus the true law of the interaction of gravitational and projectile force is now made plain, as well as the true reason why the fact of gravitational pull in the case of the two cannon balls seemed to contradict the law. It is solved entirely by the new factor of increased atmospheric resistance, but especially such increase in proportion to increased velocity.

#### PRIZE ESSAY, No. 10.

##### A Substantial, Personal God a Necessity.

BY H. F. HAWKINS.

The natural state of all material bodies is admitted to be rest—inertia. In this state they would forever remain unless caused to move by the actual contact of some other substance. This being true of aggregated matter, it is equally true of diffused matter. If a cubic yard of stone has no power to move itself, neither has a cubic foot or a cubic inch of the same stone, and, if it be reduced to its ultimate atoms, if there are such atoms, nothing is gained—it is still motionless. The rule does not vary according to the mass, but is uniform regardless of the mass.

But the whole universe of organic and inorganic matter is continually moving,—changing position. The forces or substances causing all this motion, are entirely beyond our powers of recognition as matter. They escape every test, either physical or chemical. This forces the conclusion that they are not material, but something they must be, because, there can be no effect without a cause, and matter in motion must have a cause for its motion.

If these causes of motion are not material, they must of necessity be immaterial substances, but *substances* they must be. If not substances, they are nothing—nonentities, and we have motions of inert matter without a cause. These substances, or forces we shall call them, such as gravity, cohesion, electricity, magnetism, light, heat, life, mind, spirit, etc., are the controlling, governing and ruling powers over matter at all times and under all circumstances. Hence, they must necessarily be

superior to matter or it could not thus be controlled, governed and ruled by them.

If matter is indestructible, which is not disputed by any one, then these immaterial, superior, controlling, governing forces, are equally indestructible. Do they, then, depend upon matter for their existence, or, do they, can they, will they exist independent of matter? We answer: matter is wholly dependent upon them. Without cohesive force there never could have been a material form in the universe. If matter be admitted to have existed primarily in a diffused state as the nebular hypothesis supposes, it would have remained so until this day and for all time, had not gravity appeared to draw these atoms together, and cohesion walked up to bind them. The fact that matter is governed, controlled and ruled by these forces, and, at all times renders itself obedient to them, proves five important facts: 1st. It proves these forces to be superior to matter. 2d. It proves they did not arise from matter, because matter is motionless, thoughtless and lifeless, whereas, these forces are noted for these very things, so conspicuously absent in matter. The thing formed can not rise above the power that formed it—the thing created can not rule its creator. Hence matter can not be the origin of these forces. 3d. It proves their indestructibility. 4th. It proves their origin to be superior to them and doubly superior to matter. 5th. It proves they are independent of matter—can exist without matter, for, as they are superior to, and did not arise from matter, they do not depend upon matter for their present or future existence, and, furthermore, we know that gravity, light and magnetism for example can and do exist in a practically perfect vacuum, without any loss of force.

Granting the universe of matter, and give it all the motion you desire, it would be a physical impossibility to produce life, intelligence or mentality. Motion is a nonentity. Matter, per se, is lifeless, thoughtless, mindless, senseless, and how have you changed its properties or attributes by putting it in motion—causing it to continually change its position in space? Is matter in motion different from matter at rest? If so, then it is more than matter, and, consequently, not matter. You have added nothing to it whatever. You have simply changed its position in space. It is the same lifeless, thoughtless, mindless, senseless matter. You have added motion to it, have you! But please remember, motion is a nonentity—nothing, and ten thousand nonentities added to unit leaves it still unit. "Simply that, and nothing more."

We take our stand upon this immutable position, that the thing that forms or creates another thing, can not impart any higher qualities, attributes or powers to the thing formed or created than was possessed by the original, and we defy the materialist to shake us from our foundation. We behold man, a self-moving, living, thinking, loving, reasoning, passionate, sensitive creature, and consistency, common sense, and every known fact in nature forces us to say: he came from some source possessed of all the qualities, attributes and powers he possesses, and probably many more not imparted; and further, that the origin—his Creator—possessed all these attributes and powers, *at least as fully, and probably far superior to man's endowments.*

Until it is shown that matter is self moving, we must believe it moves only when moved by

some other actual substance. Until it is shown that matter can produce the forces that are so far superior to it as absolutely to rule it, control it and govern it at all times and in all places and under all circumstances,—that it even produces the cause of its own form and existence as a material body,—we must believe these forces had some other origin. Until it is shown that these forces which thus govern and control matter, are less real than matter, we must believe they are just as indestructible, substantial and eternal as matter. Until it is shown that matter is self-moving, living, reasoning, passionate, sensitive, willing and rational, we must believe, we forever will believe that man, who possesses all these endowments, originated from some substantial source *not* material, hence *immaterial*, which was endowed with all the attributes and powers found in man, and that this origin was necessarily a living, self-moving, thinking, loving, rational, intelligent Creator,—the Christian's God.

New Madrid, Mo.

**The Art and Philosophy of Great Longevity,  
or How to Attain Vigorous and Youthful  
Old Age.\***

INTRODUCTION.

BY THE EDITOR.

Exceptional cases of longevity, continually occurring both in this country and in Europe, extending sometimes far beyond a hundred years, prove in the most conclusive manner that normal and average humanity is capable of much longer life than the so-called allotted three score and ten years.

Indeed, it would seem from many rational considerations, if we weigh all the circumstances attending the exceptional cases of longevity referred to, that with a correct physiological and hygienic system of treatment from youth up to maturity, every man and woman of good constitution should and actually would attain the age, at least, of one hundred years, and in a majority of instances vastly greater age, barring accidental circumstances. And the writer has no doubt but that under such improved culture of the physical powers exceptional cases of longevity, extending forty and even fifty years beyond a century, would become more common in time than are the exceptional cases now which reach beyond three score and ten.

The reasons for this belief seem to us to be based on the well attested law of heredity that as the progenitors improve in physical and vital qualities which tend to greater longevity, the offspring subjected to similar culture and naturally inheriting its effects from parents, must on the well-known principles of natural and intelligent selection improve upon those qualities which gave long life to their parents.

The unparalleled advancement in all sorts of improved conditions of life and its environments, during the last preceding hundred years, proves to the minds of comparative physiologists and philosophers that there are no good reasons, visible or invisible, why the longevity of the race should not soon take a

stride forward, and show corresponding advancements under the scrutinizing culture of such rapidly progressive civilization, thus causing increasing length of human life, by which to reap the full advantages of human experience, to keep pace with the improved facilities for its enjoyment.

That some one should come to the surface, by accident or otherwise, to strike the keynote of such harmonious natural conditions, and such improved processes of physical culture as will tend to revolutionize the average longevity of the race and advance it immensely beyond its present standard, seems just as reasonably probable to thoughtful observers as that there should have been a Watt when the steam engine became a necessity, a Morse when the world needed the electric telegraph, a Howe when the common sewing needle could no longer supply the wants of mankind, or a Stephenson and Fulton when greater transit facilities by land and sea were demanded by the rapid strides of advancing civilization.

The writer claims no merit on his own part for any discoveries or processes he may have been instrumental in setting on foot in the direction of improved longevity, but regards the fortuitous circumstances under which he was placed forty years ago, as among those fortunate accidents in the reign of providential law by which every great improvement that places the race on a higher plane of civilized progress, is inaugurated when the world has ripened for its reception.

He believes, as firmly as he believes in the intrinsic relations of cause and effect in the realm of mechanics, that the accidents or incidents which about that time led him to make certain physiological experiments upon his own organization, are ultimately destined in the very nature of hygienic and physiological law to revolutionize the science of therapeutics. He further believes that in the progress of this new régime as well as new regimen from generation to generation, as its effects become more fully demonstrated in the practical increase in longevity, the work of the pharmacist will become practically obsolete, while that of the physician, except under greatly changed limitations, will chiefly be known as a matter of history. He looks forward to the good time coming when knowledge shall so have increased that men and women will know how to treat themselves for the common ailments of life, and will even be able, without a doctor and without medicine of any kind, to ward off such ills with proper care before they shall have made a lodgement in the organism.

The pages to follow this introduction will faithfully unfold and set forth the experiments justifying these predictions, the causes and processes of reasoning which led to them, and the surprising and even astounding effects which they produced in raising an emaciated invalid given up by his physician to die, to a condition of vigorous health which now, after forty years and at the age of seventy, bids fair, barring accidents, to last for many more years to come.

In fact the writer considers his own present longevity, taken in the light of his physical condition at the commencement of his new system of treatment, as equal already to a full century of years, lifted as he has been to robust health from an utterly broken down constitution, with one lung partially destroyed

\* From a work of this title by the Editor, which was to have been published but which was abandoned, at least for the present, for reasons given in the April number of the present volume of the *Microcosm*, a condensed pamphlet having been printed instead. See notice of the pamphlet at the close.

and the other badly weakened. To have revived and then survived forty years, he practically counts under the circumstances as nearly two years for every one he has since lived and worked.

In truth he simply knows, just as he knows any other physical fact coming within his own observation, that the hygienic treatment he then discovered, and has ever since faithfully put into practice, saved him from a consumptive's grave, which his brother had found the year before, and which they had both inherited from their mother.

'Tis true his years ever since have been an assiduous struggle for existence, his damaged lungs being like the shattered fortress of a besieged army, requiring constant watching by the most vigilant sentinels, thus giving all the more credit to the system which has saved his life.

He has waited patiently for these forty years of experimentation to roll around before formally announcing the effects of his discoveries, though, as stated in the Preface, he has frequently been urged by practising physicians to give the world the benefits of his wonderful experience. Contrary to these urgent suggestions he resolved, even at the start of his experiments, to say nothing about his discoveries publicly until he could feel, by absolute personal assurance in watching their effects upon himself, that they had done all that he claimed for them at the start, namely, —carried his shattered constitution even beyond the fair equivalent of what he regarded and still regards as *five score years of longevity*.

Believing this to be only a fair proportionate discount for his physical condition in 1849 and for his necessarily fluctuating condition since, in which the slightest cold upon his lungs would have been fatal had he been deprived of the benefits of his discovery, he has now no hesitation in boldly proclaiming to the world that, given a good constitution to start with, the new treatment would, barring accidents, carry any man or woman safely and surely beyond one hundred years of vigorous health, should it be commenced early in life and bravely prosecuted according to the programme mapped out in the following pages.

Looking philosophically at the beneficial results which naturally accrue from the accumulated entailments of human experience, it does not seem reasonable or according to the manifest purposes of a beneficent Providence, just as a man reaches the age of sixty or seventy, and by experience, study, and acquaintance with the world has become qualified for the prosecution of great business pursuits, social and educational enterprises, etc., that he should find himself obliged abruptly to settle up his earthly accounts, and with a house full of mourners become food for worms. We aver our belief that it is not nature's plan, under our enlightened civilization, nor do we believe it to be the will of God.

Man does not seem to have been made to give up the ghost just as he had got through with his business schooling and had become qualified by experience and education to make nature subservient to his behests. It is inconsistent, in our judgment, with the manifest designs of an all-wise Providence, just as men and women have fitted themselves for successfully battling with nature's laws and forces,

and just at the period when they have cultivated the keenest relish for the work they have begun and the highest appreciation for the enjoyments of life and its uses, that the fatal ax of destiny should fall and cruelly end their career.

This very desire to live on and prosecute the work successfully begun, or retrieve errors which have just been discovered, intensifies as age advances, unless paralyzed by the absence of health and mental vigor (which are abnormal conditions growing out of abnormal senility), and this very craving for longer life implies the purpose of nature that the want should not be the mockery of malignant fate.

That the desire to live on does really intensify with age, especially when the intellect remains clear and the capability for mental aspiration remains normal, we have thousands of proofs all around us. Witness the case of Herr Krupp, the great gun-maker of Germany, who recently died in the midst of his enormous business enterprises. When taken ill he said to his doctor—one of the most eminent physicians in the Empire:—"Give me ten years yet in which to finish my work, Doctor, and I will enter into bonds to give you a million dollars!"

The doctor, of course, tried his best, but could not give him a single month, chiefly because he had nothing to suggest or administer by which to counteract the fatal inroads of his diseased condition save medicines,—drugs of diverse kinds,—which possibly, as mere physiological expedients, only hastened the final result.

In this connection the question presents itself, what is old age and how is it caused? Why do we grow old; why do we lose the youthful tint of health and beauty; the manly glow of vigor and strength; the flexibility and elasticity of the prime of physical and intellectual life? Can these questions be answered; and when answered, can the causes which lead to such deplorable results to any extent be warded off or mitigated? We believe they can, and we will now try to give to the reader the benefit of our reflections.

Old age, undoubtedly has its direct and efficient cause, both physical and mental, but it is not simply and solely, as some have supposed, the number of years a person may have lived, or otherwise all persons at seventy, for example, would be of the same vital, mental and corporeal senility. Yet it is well-known that many persons at fifty or even forty-five are more senile and decrepid, both mentally and physically, and without special or accidental causes, than others at seventy or even eighty years.

Much of this difference in mental and physical vigor, we confess, comes, or may come, from heredity, and much of it in hereditary concurrence with other vital conditions and surrounding circumstances. But we aver our belief unshakenly, that whatever the complexity of causes leading to early senility or premature old age, man now has it within his power, properly instructed and armed, largely to ward off and counteract these general causes and even to neutralize transmitted tendencies toward early decay which so readily accept unfavorable conditions even in their incipency.

The very first step in this search for the true cause of old age is to ascertain, if we can, by comparative investigation, what old age or



physical senility really consists of as contrasted with youthful or mature manhood as in the prime of healthful vigor. This can be ascertained by simple observation.

The most critical analysis has shown the tissues of the organism in the aged to have become, to a certain extent, indurated or hardened by the admixture of earthy substances with the pure organic flesh of the man as he was when in the prime of vigorous health. Hence the stiffness of limbs and want of general flexibility so commonly observed in aged persons.

What then is the immediate cause of this organic induration or rigidity of structure which so soon begins to show itself after the prime of life has been past? Plainly it is the following: Up to the prime of life the bones continue to grow in quantity and solidity, thus to a large extent utilizing the osseous matter taken into the circulation with nutrient substances such as all kinds of food, vegetable as well as animal.

But when the bones have ceased growing and no longer require this constant supply of osseous matter, the eliminating functions proceed to repel it as foreign substance and try their best to cast it from the system with the waste and worn out tissues to be excreted from the body, thus trying to leave the organic tissues free from the accretion of any thing but pure nutriment. This, however, these processes are not entirely able to accomplish for reasons soon to be explained, and consequently the eliminating processes begin gradually to yield to this never-ceasing supply of osseous matter, which more and more assimilating with the tissues where only pure nutrition ought to find a lodgement, hardens the texture and produces old age alone by gradually ossifying the pure fleshy tissues of body.

This indurating process, thus going on from year to year, gradually circumscribes the field of the vital circulation for its supply of nutrient substance to the organism, since the osseous matter is less permeable than the pure tissues of youth or early manhood. The circulatory vessels of the body, being thus required to supply less vital fluid to the tissues, are themselves, by the same accretion of foreign matter, reduced in their capacity by the solidifying of the walls of their microscopic channels, which become in turn thickened and partially closed by such earthy and osseous accretions, somewhat as water-pipes are gradually incrustated with mineral deposits and reduced in their capacity. In this way our vital fluid is curtailed both in the area of its field of operation and the vascular capacity for its distribution. This is corporeal or physical old age.

And as the brain itself is similarly indurated by constantly accumulating osseous accretions, thus displacing pure nutrient matter by crowding out the vital circulation which alone can keep up the vital stimulus necessary to nervous elasticity and mental action, hence, with physical decrepitude almost necessarily come dotage, mental dullness, loss of memory, etc. This again is old age in its intellectual aspect, or, in other words, it is mental senility.

Now, having ascertained what old age really consists of, as well as its immediate vital and physical causes, are there any means either natural or artificial by which these manifest causes of senility can be counteracted and old age stayed off, so to speak, almost indefinitely? We believe there are such means within the

reach of man's intelligence that will in time astound those scientific physiologists who vainly hope to solve the problem of a higher rate of longevity on dietetic limitations and restrictions, and by which less osseous matter shall be permitted to enter the circulation. We can but barely hint at the true solution of the problem here, leaving its complete unfoldment to the following chapter.\*

If in addition to the normal supply of earthy or osseous matter necessarily and unavoidably absorbed from our food and drink, there shall be permitted the absorption of poisonous matter from the refuse of the system by which to surcharge the same circulatory vessels and then unload cargoes of death into the same vital tissues, it is plain that such a reinforcement of poisonous matter will tend so to enfeeble the tissues, and so weaken their vital action that they can not eliminate the osseous matter with sufficient force to dislodge and prevent its assimilation and accretion.

Thus the tissues of every part of the body are crippled in their defensive operations in battling against their normal enemy by the constant intrusion of an insidious and poisonous foe, which ought to be and can be excluded from the circulation, but whose presence contaminates the vital atmosphere of these otherwise armed and equipped defenders of longevity.

Were the absorption of that abnormal and effete substance prevented, and these poisonous particles kept from entering the circulation to deposit in the tissues of the body their germs of disease and decay, that eliminating garrison of the organism would be abundantly able to separate the osseous and other normal inorganic matter of the food from the nutrient substances and at once drive it from the assimilating furnace.

Under the condition here intimated, by which the absorption of effete matter into the circulation shall be substantially prevented, it becomes reasonable that the osseous induration of the vital tissues—the immediate cause of old age—could not occur so rapidly, since the eliminating processes would be able fully to cope with these inorganic deposits from the circulating fluids, and for a very much longer period permit only the pure nutrient substances of the food to be assimilated. Thus the tissues would remain youthful, the organic structure elastic, and old age be kept at bay.

Even should the new treatment for the anti-absorption of poison not be commenced till in advanced age, if a fair degree of vitality still be left, the walls of the circulatory vessels may even then be cleared of their osseous accretions and the cellular tissues be cleansed of such earthy deposits by an accumulation of purer vital fluid under accelerated action, just as water-pipes are often purified of their mineral incrustations by surcharging them with a purer supply of water.

We need hardly repeat here in conclusion, that the very hygienic revolution thus made possible, by which mental and corporeal senility shall be warded off immensely, and longevity greatly extended, is what the new physiological discoveries, to be unfolded in this volume, contemplate.

[Our Condensed Pamphlet, which unfolds the new treatment referred to in the foregoing

\* That chapter has been substantially reproduced in our Confidential Pamphlet on Health and Longevity, referred to elsewhere in this number.

Introduction, has already created a genuine sensation in many parts of the country where it has been ordered and where its instructions have been carried out. Hundreds are still sending for the "Pledge of Honor" to be signed if approved. No one, however, is expected or required to sign or to return this pledge because of sending for it. It is sent freely for all to examine, and then to cast aside as so much waste paper if they do not care to avail themselves of its offer. See the array of unqualified indorsements of the new treatment near the close of this number. These testimonials, voluntarily sent us, speak more than volumes of argument. New readers should also examine our "Personal Statement" in the April MICROCOSM, which will be sent free on application.—EDITOR.]

#### MATERIAL AND IMMATERIAL ENTITIES.

BY THE EDITOR.

The above adjectives express the true antithesis of universal existence in its broad classification. It has been one of the most difficult tasks of the Substantial Philosophy to inculcate in the minds of scientific and religious thinkers, this rational and consistent terminology by which to convey the real idea of the visible and invisible entities of the universe.

All thinkers, even those of a moderate grade of intellectuality, are forced to recognize the existence of entities, of some of which none of the senses can form a direct concept, and can only know of their existence by a process of reasoning. They realize these entities all around them in the action of the invisible forces of nature, in the vital and mental forces which move and control animal organisms, and even in the material and physical air and odor which we breathe and smell, as well as in the invisible gases and vapors whose substantial presence as ponderable but diffused matter we can so easily demonstrate.

Yet the vast majority of such thinkers seem to have formed no conception of the real classification which should be made and maintained between these various phases of substantial existence; and even those investigators who do finally reach the true distinction forced upon them by logical necessity as between material and immaterial substances, still have a very confused and indefinite conception of the mixed condition of these entities.

We have known men who thought they had fully grasped the essential elements of Substantialism who would still talk and write vaguely about *matter* and *substance* as antithetic, and thus contrast the *material* and the *substantial* in nature,—just as if they were true opposites, or as if *matter* was not in every conceivable case *substantial*.

Ask such a writer if a rock is not *substantial* as well as *material*, and he would be shocked at the absurdity of the question. Yet he will antithetize *matter* and *substance* as if they were essential opposites.

Others, especially of the theological school, will write and speak with the same learned vaguity and want of precision, of the *material* and *spiritual* existences as if the two classes were antithetic; whereas there are numerous entities all around us in nature that are neither *spiritual* nor *material*. Ask such a theologian if magnetism, sound, light, heat, gravity, electricity, cohesion, etc., are *spiritual* substances, and he would at once re-

pudiate such an idea with surprise at the stupidity of your question. Yet he has formed no conception of how to classify them as among the universal entities of nature since he has just antithetized everything under the two terms *material* and *spiritual* substances.

He would not think of classifying magnetism, which goes freely through all material bodies, as a material substance. What then would such a theologian do with the physical forces named, since they are neither *material* nor *spiritual*? He would evidently have to ignore them altogether as entities, and leave them where the transcendental physicists of present science have placed them, namely, among mere modes of motion of material molecules. And when this mist-envisioned theologian reaches that point of physico-metaphysical ratiocination he will find his so-called mental, vital, and spiritual entities, on which he depends for his certitude of a future life, scientifically passing into the corresponding modes of motion of brain and nerve molecules under the magic-lantern process of Hæckel's dissolving views as exhibited in his "History of Creation" by "spontaneous generation out of inorganic matter."

Substantialism ten years ago found the church and the colleges in this very confused and unsatisfactory state of terminology, and as its development progressed it was forced to the necessity of cleaning the ground anew by a radical grubbing out of this rank indigenous undergrowth of scientific confusion of which the soil of scholastic materialism had become so prolific.

The first generalization of the new philosophy was to classify all the entities of the universe into *material* and *immaterial* substances, and thus sweep away the imperfect antithesis of *material* and *substantial* things, and also the equally weak contrast of *material* and *spiritual* entities.

In the domain of the *material* it was but an easy task of minor classification to distinguish the almost endless varieties and gradations of material substances from the densest to the most attenuated,—from platinum, for example, to hydrogen gas, or even to odor, the most tenuous of all known substances which bear any marked characteristics of matter.

In this chain of gradation from the dense to the rare,—from the grosser forms of matter to those sublimated and diffused forms which touch the very border land of the immaterial realm,—innumerable varieties of material gradation were found to exist, the very air alone forming one of the most universal, important, wonderful and instructive of these palpable divisions, being both intangible and invisible in its quiescent state. Yet our air is ponderable, and when in motion it is destructive of life, while being at the same time absolutely essential to life.

Materialists in science as well as in theology might readily realize a lesson of vast importance in studying our atmosphere and thus tracing from its invisibility and intangibility the possible entities of the immaterial realm all around us, no less substantial and real because they take on the absolute properties of incorporeality which our wonderful atmosphere does not possess, and by which, as in the case of sound, light, heat, magnetism, etc., all materiality is dispensed with and excluded.

In thus entering the immaterial domain of nature we find the same gradation from the

gross to the refined, from the denser or more intensified, so to speak, to the more sublimated essences of immaterial substances, the same as in the case of the material domain. We find three sub-divisions of substance in this realm all strictly classified among immaterial substances, and all belonging to the general department of the natural forces.

We have first the purely physical forces such as those of gravity, heat, sound, light, electricity, magnetism, etc. These are of various grades of grossness and refinement, possessing different properties or methods of effecting bodies or modes of conductivity. Yet all of these are equally entitative in the substantial realm to which they belong.

The second division or sub-class of immaterial entities in this domain of substantial existence, is that of *vitality* or life. Vital force belongs to all organic substances of whatever nature, but may exist separate as crude vital force in the universal fountain constituted, as Substantialism surmises, of the essential exterior being of God himself, which also embodies, according to the conception of most Substantialists, the crude or unspecialized physical forms of force named in our first sub-classification above.

Yet this mighty fountain of force, exhaustless as God's omnipresence, including both the physical and vital departments of immaterial substance, does not touch the more refined and sublimated of all the forces,—the mental, and in its highest degree, the spiritual, entity of intelligent personal existence.

Although this force of spiritual mentality, with that of vitality, constitutes the personal individuality of God himself on an infinite plane of operation and realization, yet it extends downward as threads of mental being from his central throne, ramifying every organic and sentient creature from man and the higher orders of animals to the lowest moneron or animal form which shows a sign of conscious and sentient existence.

Many doubt the propriety of attributing the term mind or mentality to the lower orders of animals. They do not, however, doubt but that these creatures possess intelligence, but prefer to designate it by the term instinct, thus confining mentality alone to the human race. We think this to be very nearly a distinction without a difference.

*Intelligence*, such as the dog possesses, is from the same root as *intellect* which is the same as mind. The concession of mental powers to the lower animals is in our judgment innocuous to the claim of man's essential superiority to the lower orders of the animal kingdom, and furnishes no philosophical ground for the belief in brute immortality, as some writers have supposed. That animals really *think*, no more proves that they shall or should share immortality with man, than the fact of their possessing *life* in the true sense of the term proves the same thing.

To man alone, however, is given this mental force in its highest degree of unfoldment, namely, in the self-conscious rationality which culminates in the spiritual *ego* of absolute personal selfhood. This is what allies man to God, and constitutes him a mental and spiritual personality susceptible of an existence in the two-fold spheres of being,—one in the material body relating him to the brutes that perish, and the other in the vital, mental and spiritual organism, identifying him with

the realm of pure personal mentality and spirituality by which he becomes allied to the infinite mind and to a possible association forever with the personality of his Father in Heaven.

But although the lower orders of animals perish as to their conscious, vital and mental being, thus resulting in an absolute cessation of existence as individuals or as separate vital and mental organisms, it remains true nevertheless, as the law of the conservation of all energy requires, that not an iota of this vital and mental force-substance of the lower animals is annihilated or lost on that account. As their bodies go back to the material elements whence they came, to be again employed in the economy of nature for the building up of other material organisms, so their mental and vital powers, when no longer of service to the material forms which for wise and temporary purposes employed them, subside into the vital and mental force-element of nature, constituting a part of the universal fountain, there to subserve the purposes of God's infinite plans for reproduction in this and perhaps in other worlds, so long as the present system of nature shall be continued.

Such is a cursory glance at the nice distinctions which Substantialism has formulated and now sets forth in order to harmonize and set in order the confused nomenclature of modern science and modern theology.

It presents *matter* as but one general department of the substances of the universe and thus enforces the conception which some minds find so difficult to grasp, that substances—real objective entities—may be *immaterial* as well as *material*.

The difficulty of thus conceiving is all owing to a want of proper mental culture. It is a lack of proper scientific education that a man can not conceive of an *immaterial* substance the true antithesis of *matter* as well as a *spiritual* substance involving the same antithesis. If *spiritual* entities are not *material*, then common sense, even without special culture, ought to teach us that these must be *immaterial substances*, or else no substance at all.

Some men who have drifted listlessly into certain crude conceptions or false ideas, such as the notion that whatever is not material is a necessary nonentity, appear to have become by habit too lazy to do any stalwart thinking for themselves.

We are now advocating Substantialism as much as for anything else, for the purpose of arousing men and women to the habit of *thinking*. We have little fear of any long continued reign of false science or materialistic theology if we can only create a furor of thinking—an epidemic of mental action—throughout the length and breadth of the land.

Professors of physics now go half to sleep over their blackboard in sketching out and explaining old physical problems and fossilized solutions; and as yawning is contagious, the students become as somnolent and as innocent of sound, original thought, under such sleepy instruction as their teacher; hence, scientific stupor and self-contentedness have become the order of the day in our class-rooms. What we want now is thoughtful, original, inquiring teachers always upon the alert for new truth, never satisfied that we have yet reached *ultima thule* in any department of scientific research.

That is the spirit Substantialism is trying to



inspire and inculcate in the minds of our young men who are soon to take the places of the old professors who are neither ready to receive new truth in science, nor willing to let those receive it who are ready. Substantalism proposes a radical revolution both in the methods of teaching and in the things taught.

**The New Pamphlet on Health and Longevity—  
What the People Say of it.**

We are glad to be able to announce to our readers that we are now beginning to receive reports of the impressions which the confidential pamphlet has made upon those who have received and read it, and in many instances upon those who have already put its teachings into practice.

We are very much gratified to be able to state that in every case heard from, where its instructions have been followed out, decided benefits have resulted to the possessor of the discovery; while many who had before spent hundreds of dollars and years of suffering under medical treatment, are enthusiastic over the new remedial departure and its results.

Many hundreds, however, who have sent for the "Pledge of Honor," are still waiting in suspense to obtain additional information by correspondence with this office, before deciding to sign the obligation and send for the pamphlet.

Many of these inquirers desire to know something in regard to the preliminary outlay required for putting the new treatment into practice after they shall have sent for the pamphlet. To all such inquirers we now say, that the entire cost of carrying out the treatment after having procured the pamphlet of instruction, need not exceed \$1 in any part of the civilized world; while the time required for its thorough application need not exceed half an hour every second, or in many cases every third, night before retiring. *All the rest is within the reach of ordinary adult intelligence after the pamphlet shall have been well studied and the rationale of the treatment duly understood.*

We are overwhelmed with questions of all kinds upon this subject, sometimes from a hundred correspondents in a single day. We actually are doing the work of three men in the prime of life every day we live, and human nature could not endure such strain but for the recuperative effects of the very treatment we are laboring to make known. Let no one feel slighted, therefore, if in the midst of such incessant work some neglect of correspondence should occur.

In reply to substantially the same question by more than fifty physicians, we will say in a single answer, that doctors are of course permitted in the Pledge of Honor to use the treatment with their patients, but are obligated not to show or reveal the contents of the pamphlet. If physicians are willing to pay for their pathological education, as everybody knows them to be, and that liberally, they will not, in the opinion of their co-workers who have tried it, regret the investment necessary to secure the pamphlet whether they shall ever employ the treatment in their practice or not.

One learned physician—a graduate of several medical institutions—who had carefully read the pamphlet, recently remarked to the writer that, as a single example of its revelations, the novel and original cure for kidney diseases as therein set forth, and without medicine, was

so new to pathological science and so important to human life, that no M.D. could afford to be without the knowledge in his practice; and that the cost of the pamphlet was but a bagatelle in comparison. He even generously intimated that such a remarkable physiological discovery, constituting as it does a part of a new system of treatment, and hitherto entirely overlooked by pathologists, was so startling and revolutionary as to be alone sufficient to immortalize the discoverer.

We place these statements on record, not from any feeling of vanity,—for we have long since outgrown all such youthful impressibility,—but alone to benefit the medical fraternity, relieve the sufferings of humanity and give to the world the benefits of a more exact, enlightened, and elevating knowledge of physiological science.

We will here merely remind the medical profession, that so far from this treatment smacking of quackery or charlatany, the entire health-restoring and health-preserving system of hygiene as set forth in our pamphlet, is now offered to the public as a legally authorized formula for the cure of disease and the prolongation of life regularly prescribed by Richard F. Stevens, M.D., of Syracuse, N. Y., one of the oldest and most experienced physicians in this State, and that, too, after having employed it both on himself and with his patients for more than twenty years.

Reverting to our "Pledge of Honor" we will say, in reply to many inquiries, that husbands and wives are regarded as one in all matters pertaining to the privileges of this treatment, and either or both of them can sign the "Pledge of Honor" for the family. Also it is understood that children, whether married or single, whether living at home or not, are included in these privileges of the "family."

Those who may wish to examine this pledge even out of curiosity, can send for it without feeling under the least obligation either to sign or return it, but are at liberty to regard it as so much waste paper as soon as they shall have read it.

We were urged at the time of preparing the pledge to attach to it a money penalty of a considerable sum in case of the violation of its secrecy; but we peremptorily declined the suggestion, preferring to trust to the honor of those who may sign it, just as they have to trust to our honor in the value of what we propose to send them. A man who would not regard his honor to keep his pledge inviolate, in such a case, would soon encompass means for evading a cash penalty however exacting.

Any readers of this paper who have not seen our "Personal Statement," as printed in the April MICROCOSM, which unfolds all the reasons for issuing our "Confidential Pamphlet" instead of our 500-page volume as at first contemplated, can have a copy of that number free by so intimating.

The following is a mere specimen of the voluntary acknowledgments of the pamphlet which we have received from those who have sent for it. We could already fill a complete number of the MICROCOSM with similar enthusiastic indorsements, though but a single month has passed since its issue, but we must not consume any more space for this purpose:

The very first man who ordered a pamphlet—Dr. Elihu R. Pettit, of Philadelphia—writes:

"Dr. A. Wilford Hall, Dear Sir:  
"Your 'Health' pamphlet was received three weeks

ago to-day, that is, on Good Friday, my copy being, as you wrote me, the first order you had received. I have pursued the treatment faithfully since that day. \* \* \* I have suffered from nervous prostration from overwork and close confinement for years, having broken down completely four times. As the cause producing my ill health continues, I did not expect much benefit till I could obtain rest during the summer vacation. \* \* \* The change in my condition has seemed wonderful; I do not experience more than half as much exhaustion from my work at the end of each day or week, when before I was 'like a wet rag.' My mind is clear; eyes brighter; dull heavy 'headachy' feeling gone. \* \* \* It has been the best investment of any \$4 I have ever made. \* \* \* You deserve more than my warmest thanks and gratitude. \* \* \* Your treatment is based upon true physiological principles. My three week's treatment of myself has fully confirmed the judgment expressed, which had previously been formed from reading your pamphlet.

"Will you please send me a dozen or more of your pledges? I think I can send you two orders at once, and I could also send you several others, but that I have advised them to wait a while to see its effects upon myself," etc., etc. Very truly yours, E. R. Pettit."

Mr. Barnes, of 130 Fulton Street, an old resident of New York City, writes:

"Dr. A. Wilford Hall:  
One month ago I purchased your pamphlet unfolding the new treatment for the cure of disease without medicine, as foreshadowed in the April number of the *Microcosm*. I need hardly tell you that I read it carefully and was surprised at its disclosures. It produced conviction because it met the approval of my judgment. I then proceeded to put the treatment into practice upon myself, and with the most gratifying results upon my health. In no period of my life, of more than sixty years, have I been so free from pain as during the last four weeks, in which I have used your treatment every second night. I can now perform more labor with less fatigue than I could thirty years ago. From childhood I have been subject to terrible headaches, which have confined me to the house and unfitted me for business at least one day in each week and often for a whole week at a time. Since the second application of the treatment as directed in your priceless pamphlet I have not had even the semblance of a headache or any other ailment; and from what I now know of your discovery by practical experience I would not take \$1000 for the information I have received. Indeed, doctor, you can not name a sum that will compare in value with the benefits I have received, suffering as I had previously done for so many years. This discovery must, in the nature of things, build an imperishable monument to your memory. You are at liberty to refer to me at any time for the real merits of your discovery.

Yours very truly, Joshua Barnes.  
May 22, 1889. "130 Fulton Street, New York,"

Mr. I. N. Gardner, of Whisler, Ohio, one of the earliest purchasers of the pamphlet, writes:

"Dear Dr. Hall,—Inclosed find pledge of honor executed by Wm. Famuleuer with the money for one of your pamphlets for him. I want you to send me some more blank pledges, as there are several persons who are talking of sending for pamphlets. Your treatment has created quite a sensation in the case of Mr. Ballard of whom I wrote you. He was given up by the doctors to die, and had not left his bed for seven weeks. But in five days after commencing your treatment he was up and cheerful. Everybody now says he is going to get well. In my own case I was never without dyspepsia, having a sour stomach and burning sensation continually, with a woe-begone feeling as you describe it in the pamphlet. But I am glad to report that I have not felt it since the first application of your remedy.

"I. N. Gardner."

Louis George, Kansas City, Mo., writes:

"I have been twenty years in business in this city and am known. I have tested your treatment and have gone far enough to give it my hearty indorsement. If you wish to refer any body to me for the value of your discovery you are at liberty to do so.

"Very truly yours, Louis George."

Rev. George Cook, Millican, Texas, writes:

"Dr. A. Wilford Hall, Dear friend:  
I esteem it as one of the greatest pleasures of my life, after reading your 'Pamphlet on Health and Longevity' without medicine, to say that in my candid opinion it is the most valuable discovery of the age. As a physiological treatise alone it is worth many times its cost. After testing its practical effects upon myself, the result has been far beyond my expectation, especially considering the number of times (only three) I have used it; and considering also my condition when

I commenced [suffering under a severe stroke of paralysis]. I can conceive of no system which could be more agreeable to reason than the rationale of your discovery and treatment as set forth in your pamphlet. Its beneficial effects upon myself during the past four days have been such that I certainly will have no hesitancy in commending it to my friends. I know of several now who will be glad to possess this knowledge, having noticed the wonderful change in my own condition; but as you do not suggest how these orders are to be made, I await your reply. Whatever influence I may have I shall be glad to use it in making known the inestimable value of this treatment. Inclose a few press notices to show you my condition when I first wrote you for the pamphlet. To-day I am able to walk about the house and to write this with my own hand; and again I feel that I have reason to thank God for the gift to the world of A. Wilford Hall.

Yours truly,

"George Cook."

Two of the press notices sent us read:

"Rev. Geo. Cook was stricken with paralysis at Millican last week, and it is feared will be an invalid for life."—*Flintonia Argus*.

"We are pained to learn that Rev. Geo. Cook, of Millican, has had a stroke of paralysis. We hope he may recover from this severe affliction. He is one of our most devoted and successful preachers."

George D. Norris M.D., New Market, Ala., writes:

"Dear Dr. Hall,—The pamphlet on Hygiene arrived on April 23. I am now, after a careful and critical reading of it, ready to answer. Your reasoning, although novel, is convincing, and I can confidently and truthfully say it is logical. I am so much pleased with your views, that I am using your treatment on a lady patient, and can report that it is having a good effect. I intend also soon using it personally. I am nearly eighty years old and have been in constant practice since April 4th, 1831. That you may know who I am, I will say, that I am a graduate of the University of Maryland; a member of the Alabama State, and Madison Co. Medical Associations; also a member of the American Medical Association, and Trustee of the Alabama State Hospital for the Insane. I will keep you advised as to the effects of your treatment; and I will be glad to recommend it to others, particularly to the medical profession. I am respectfully your friend.

"George D. Norris, M.D."

The Rev. James B. Dibrell, Sequin, Tex., writes:

"Dear Doctor,—I hardly know how to express my gratitude to you for your marvelous discovery. It is all and more than you claim for it, in my candid opinion. It is the thing I have been longing and praying for ever since my sore affliction. I now feel since using it like a new man. I have just used it on my little boy, who was threatened with a bilious attack, and it worked like a charm. Talk of any man's not sending for it on account of its price, \$4! I would not be without it for four thousand dollars. \* \* \* Why could not this treatment be applied to improve the physical condition and save the lives of our valuable animals, such as horses for example? (It certainly can be. En.) If I am right in this supposition, would it not add greatly to the money value of your discovery? Let me also suggest that you have the pamphlet printed in German. This would be an immense field for its application. I could do much good in calling the attention of the Germans to its advantages. \* \* \*

"Sincerely yours, James B. Dibrell."

Rev. J. Weber, Stoutsville, Ohio, writes:

"Dear Dr. Hall,—Your pamphlet is received and read with intense interest. I regard your philosophy of health and longevity as consistent throughout with all we know of anatomy and physiology, and it must appeal on personal most favorably to the unbiased judgment of every intelligent person, either physician or layman. So far from regretting the \$4 I sent you, I would now consider it cheap had it been \$400 instead.

"Truly yours, J. Weber."

O. N. Bryan, of Marshall Hall, Md., writes:

"I think I shall have a call for at least four of your 'Pledges of Honor,' which you will please send by return mail. My health is steadily improving under your treatment. Yours truly, O. N. Bryan."

Rev. A. B. Prichard, Lebanon, Tenn., writes:

"Inclosed find the money for another of your pamphlets for a friend—the Rev. L. N. Montgomery. Your treatment has already made a wonderful improvement upon my health. Very truly yours, A. B. Prichard."

Mr. Samuel Richards, Newton, Iowa, writes:

"The two pamphlets for Dr. Engle and M. B. Johnson, for which I sent you a check, have been received and delivered to their owners some days ago. Brother Johnson is enthusiastic over your treatment, and says he would not be without it for one hundred dollars. My

[\* The omissions indicated are generally such as would reveal the process of the treatment if printed.—Ed.]

son is also greatly benefited by the new remedy. Wishing you the grandest success, I am truly yours,  
"S. Richards."

J. A. Wetherbee, Waynesboro, Miss., writes:  
"Dr. A. Wilford Hall.—Your pamphlet for the preservation of health and cure of disease, has been received and read, and I consider that I have found a real treasure. Many here are desirous of securing it. Send me one dozen blank 'Pledges of Honor' and I will get them signed.  
In haste, yours truly,  
"J. A. Wetherbee."

E. L. Livingstone, Port Hope, Ont. (Canada), writes:

"Dr. A. Wilford Hall, Dear Sir:  
"Since purchasing your confidential pamphlet, I have used your treatment some half dozen times, and find it all you claim it to be. Since the first application I have not once had to resort to medicine as previously, though being much on the road I have not had the opportunity of attending to the treatment as I otherwise should have done. Wishing you the success which your discovery deserves.  
I am yours respectfully,  
"E. L. Livingstone."

Rev. Jas. Dick, of McPherson, Kan., writes:  
"Dr. A. Wilford Hall.—Far out over these prairies I hear you sing: 'Watchman tell us of the night; what its signs of promise are.' I have been a careful watcher, for three weeks, of the effects of your treatment in my own family, and I send you as a response to your call that the night of disease and suffering is beginning to give way, and that the day of health and joy is breaking. In a word, the 'plg in the poke' has proved a porker of the fattest kind, and ~~some~~ you may sell thousands of them. The treatment is a success; my wife is improving under it and my son's stomach and kidney trouble is yielding to it beautifully. He says his health is better now than it has been for several years. A number of afflicted persons here are waiting to see the effects of the treatment in our case before sending for the pamphlet. I don't blame them, as there is so much fraud and deception practiced; and besides, they do not know the author of the pamphlet as I did. \*\*\*  
"Yours truly, James Dick."

T. W. Reed, Macon, Mo., writes:  
"Dr. A. Wilford Hall, Dear Sir.—I received your pamphlet on 'Health and Longevity' promptly after sending my order, and commenced immediately to use the treatment as you direct. I have no words to express the suffering I have endured for the past fifteen years. Medicines were of no avail; but I now feel like a new man. Your treatment has removed my trouble completely. I candidly consider your pamphlet cheap at \$20. You ought not to have placed it at so low a figure as \$4. Still, if you had offered the discovery to the public at twenty-five cents, many would want it for a dime. Write me and let me know how I can aid you in extending its circulation.  
"T. W. Reed."

Dr. R. B. Dando (M.D.), Alta, Iowa, writes:  
"Dr. Hall.—Inclosed find postal note and a signed pledge for another pamphlet for one of my patients. I can not help thinking that you are conferring one of the greatest of earthly blessings upon suffering humanity.  
"Yours, etc., Dr. R. B. Dando."

Dr. Jesse Huestis (M.D.), of Columbus, Ohio, referred to in our "Personal Statement" in April MICROCOSM as fully endorsing the new treatment, writes us that he has had a bad attack of the stomach and bowels, confining him to the house for four weeks, all of which he might have avoided had he shown the precaution to use the treatment he so warmly recommends. He adds:

"All this time I have had the most positive convictions that I would entirely have escaped all this suffering and loss of time had I only adopted your 'Hygienic plan' in my own case, prior to my sickness. I was feeling so well heretofore is the reason why I neglected to put the treatment into practice, and I have paid a severe penalty for my neglect. I shall do differently hereafter, I assure you. Always sincerely yours,  
"Jesse Huestis, M.D."

J. R. Feazell, Vossburg, Miss., writes:  
"Dr. A. Wilford Hall: Dear Sir.—I hasten to say to you that I duly received the pamphlet on 'Health and Longevity,' read it carefully, and then tested the treatment as you direct. I can truthfully say that I regard it as the greatest single discovery ever made, affecting as it does, and must, the life and welfare of humanity. I have no words in which to describe my appreciation of your treatment. If you should realize from each purchaser as much as the pamphlet is really worth, and sell all that ought to be sold, you would be the richest man in the world. Yours most truly,  
"J. R. Feazell."

Mr. C. R. Gough, of Roxton, Texas, writes:  
"Dear Friend, Dr. Hall.—I was taken down with an attack of bilious fever three days before your pamphlet arrived, and when it came I was suffering greatly under the effects of strong medicine, and was very weak. Sick as I was I read the pamphlet carefully, and became satisfied that as a treatise alone it is the greatest work on physiology and the real cause of disease I ever had seen or read. Though I had a burning fever last night I tried your treatment, and I must say that it was one of the most pleasant sensations I ever experienced. The perspiration poured off me, the fever broke, and this morning I am clear of all aches and pains. So much for the start. When I have tried it further I will report. Several are waiting for its effects on me in view of also sending for the pamphlet. In haste, yours, C. R. Gough."

Dr. C. N. Udell (M.D.), of Blakesburg, Iowa, one of the leading practicing physicians and surgeons of that State, writes:

"A. Wilford Hall: Dear Doctor.—The pamphlet divulging your hygienic discoveries for the cure of disease, the preservation of health, and the prolongation of life, was received a few days ago, and after reading it carefully and critically, I have labelled the little book—'Multum in Parvo.' While as yet I have had but little time to test the merits of your treatment upon myself, I must say from the standpoint of a physician, that the pathological disclosures of the pamphlet are rational and in harmony with physiological law and common sense. \* \* \* I can only say now that with the few applications possible of your treatment within the short time since receiving your pamphlet, I am pleased with the result. All honor to Dr. Hall for the discovery.  
"Yours truly, C. N. Udell, M.D."

Rev. Henry C. Glover, an esteemed Methodist clergyman, of Parkville, N. Y., called at our office the other day and said he wanted to sign the "Pledge of Honor" and buy the pamphlet at once. The reason he gave was that he had just received a letter from his brother, James R. Glover, of Westhampton, N. Y. (who for years has been in very poor health), so full of enthusiasm about the wonderful effects of the new treatment that he either must be, said the preacher, a new man physically or else he is possessed of an imagination that a poet might well envy. Suffice it to say he signed the pledge, paid the \$4, and took the pamphlet with him. The next day his brother wrote us:

"I have tried your treatment upon myself only a few times, and have found it to be a success. Before this I could hardly rise suddenly without a tendency to pitch upon my head. I was all lassitude, and had no strength to work nor appetite to eat, and was fast becoming weaker. I have for some time been taking three of Warner's and Arnold's pills each day—morning, noon and night—as the only thing that seemed to do me any good, and was becoming very much discouraged, when I sent for your 'plg in the poke.' I have now quit taking pills and never expect to take another. I can eat beefsteak and relish it. I can go about my work as of old and not get tired, when before, the least effort tired me so it seemed as if I should never again get rested. You ought to see me now knocking around my farm as if nothing was the matter! Well, thanks to you brother Hall, and praise the Lord for this resurrection.  
"Most truly your friend, J. R. Glover."

"P. S.—I have been urging my brother Henry to get your pamphlet, as I feel sure it will make an entire change in him. You can depend upon it I shall spare no pains in making this pamphlet known.  
"G."

H. O. Baker, Verdella, Mo., writes:  
"Dr. Hall: My Dear Friend.—Your pamphlet was received nearly two weeks ago. In no other family could it have been more needed or its merits put to a severer test than in mine. My uncle, 65 years old, was pronounced incurable by good physicians. For four years he has gradually grown worse, the past winter not even being able to leave his room, till at the time your pamphlet arrived his appetite had almost entirely failed. But he commenced using your treatment and at once began to improve, and now for two days he has been out making garden! His trouble was kidney disease and gravel. \* \* \* In my own case I was a victim of dyspepsia, and have been for twenty years. Could scarcely retain a particle of food on my stomach, making my life miserable. I am now, after using your treatment for a few times, a new man, free from pain, and have a good appetite. I thank you for this great discovery.  
Truly your friend,  
"H. O. Baker."

✂ We have received a letter from Dr. Huestis, one of the above endorsers,—a most telling document. It will appear next month.



## THE LIBRARY OF SUBSTANTIALISM.

This library consists of eight volumes, all of which are devoted to the principles of the Substantial Philosophy. These volumes are:

1. The "Problem of Human Life," 534 double column octavo pages bound in cloth, price \$2, by mail. This was our first scientific book, of which between 60,000 and 70,000 copies have been sold without a dollar spent in advertising—simply by one person telling another. The discussions and original principles introduced and unfolded in that volume have led to seven other books, making up this library, as follows:

2. Five volumes of the *Microcosm*, of nearly 400 double-column octavo pages each, bound in cloth, price \$1.50 per volume, or \$7.50 for the set, by mail. These volumes contain the rise, progress and complete elaboration of Substantialism during its stormiest discussions, directly after the circulation of the "Problem" began, and are invaluable to those desiring to obtain a knowledge of that Philosophy in all its details.

3. The *Scientific Arena*, volume I, a large quarto of nearly 300 pages bound in cloth, price \$1 by mail, is a continuance of the discussions, in an advanced form, of the first five volumes of the *Microcosm* named above. The second volume of the *Arena* is not yet printed and bound, but will be after a while, and will then be included in the "Scientific Library," at the addition of \$1. Those desiring it are now sending in their names. As soon as 250 names are received it will go to press.

4. The Text-book on Sound, bound in cloth, price 50 cents, is one of the most important of the entire series of the Eight volumes. It is by the Rev. Dr. J. I. Swander, under our own most careful revision, and no man can read it understandingly without being convinced of the absolute truth of Substantialism.

## Dr. Wilford Hall's Scientific Library.

[From the *Arena*.]

"The principles of the Substantial Philosophy, with their collateral bearings, which are unfolded in Dr. Hall's writings, have cost him more than ten years of unremitting labor, such as few men besides himself have ever performed. The results of this tireless scientific and philosophical research, as therein elaborated and set forth, can be found in no other library of books on earth; and those who fail of the present opportunity to secure these unique works, at the trifling cost proposed by his publishers, will realize a missing link in their chain of knowledge, which they may always regret and may never be able to supply."

## Eight Volumes that Will Live.

"This Library consists of the "Problem of Human Life" (\$2), the five volumes of *The Microcosm*, bound in cloth (\$7.50, or \$1.50 each), the first volume of *The Scientific Arena*, bound in cloth (\$1), and the "Text-book on Sound" (50c.), amounting in all to \$11.

"By special request of Dr. Hall this entire library will be sent to any person by express on receipt of \$5, if ordered soon, or before the plates shall pass into other hands—an event probably not far distant. If sent by mail the postage, \$1.25, must be added.

"No person who has tasted the fruits of this comforting and elevating system of doctrine, as set forth in those volumes, should allow this opportunity to go by for leaving to his children an heirloom which may prove an almost priceless memento in coming generations. Bear in mind that this library can only be obtained by addressing the Editor of this paper."

## Appleton's Encyclopædia.—A Great Offer.

"We have several sets of "Appleton's Encyclopædia," second hand but in excellent condition (not the illustrated edition, but the one previous), 16 large 800-page volumes, in leather binding \$30; or in cloth \$24. Either set is worth to any student double this amount. Let no man complain after this that he lacks the facilities for obtaining universal knowledge, a thing which is only possible with a good encyclopædia.

Address A. WILFORD HALL,

Editor of the *Microcosm*,

83 Park Row, New York.

## Three Cash Prizes—\$30, \$20 and \$10.

Our contributors, and our literary, scientific and philosophical friends should not forget the opportunity we have presented for earning one of the above-named cash prizes during this volume by sending us an essay on Substantialism or collateral discussions. Remember, these essays must not be more than a single solid page of this paper, in briefer type,—1,200 words. See this announcement as first made in December, or in No. 1. of this volume. A number of writers, as we learn, are preparing themselves by study for this contest.

## What the Press Say.—A Mere Specimen of Hundreds of Unsolicited Notices.

## "A Masterly and Triumphant Refutation."

[From *The Christian News*, Glasgow, Scotland.]

One of the most trenchant and masterly opponents of this theory (Darwinism) is Dr. Wilford Hall, of New York. Some time ago he wrote a book entitled *The Problem of Human Life*, in which he subjects to a searching and critical analysis the strongest arguments in favor of evolution advanced by Darwin, Haeckel, Huxley, and Spencer, the acknowledged ablest exponents and advocates of the system. Never, we venture to say, in the annals of polemics, has there been a more scathing, withering, and masterly refutation, read or printed. Dr. Hall moves like a giant among a race of pigmies, and his crushing exposures of Haeckel, Darwin & Co. are the most sweeping and triumphant we have ever read within the domain of controversy. If our thoughtful and critical readers have not yet read the book, we venture to prophesy that they have a treat before them.

## "The Book of the Age."

[From *The Methodist Protestant*, Baltimore, Md.]

This is the book of the age, and its unknown author need aspire to no greater literary immortality than the production of this work will give him; and thousands of the best-educated minds, that have been appalled by the teachings of modern scientists, will "rise up and call him blessed." Hitherto it has been the boast of atheistic scientists that the opponents of their doctrines have never ventured to deny or to solve the scientific facts upon which their theories are based. But our author, accepting these very facts, unfolds another gospel; and Tyndall, Darwin, Haeckel, *et al*, are mere pigmies in his giant grasp.

## "The Most Startling and Revolutionary Book."

[From *The Brethren at Work*, Mount Morris, Ill.]

It is unquestionably the most startling and revolutionary book published in a century. There is no escape from the massive accumulation of facts and the overpowering application of principles in which the work abounds from lid to lid. It marks an epoch in the centuries. It is a work of Providence, and will not accomplish its mission in a generation. It unfolds truths that will stay as long as Christ is preached. Although strictly scientific, its one aim is the demonstration of a personal God and a hereafter for humanity. We never tire reading it. It is an exhaustless mine of Christian truth. It is the literary *chef d'œuvre* of the age. It is worth its weight in diamonds.

## "Meets the Wants of the Church."

[From *The Dominion Churchman*, Toronto, Canada.]

We most cordially concede to *The Problem of Human Life* the well-earned title—the book of the age. Doubtless the God of Providence has raised up the author to meet the wants of the Church in this time of need.

## "Originality, Thoroughness, and Ability."

[From *The New Covenant*, Chicago, Ill.]

We can truly say we are amazed at the originality, thoroughness, and marvelous ability of the author of this work.

## "The Death-blow of Atheistic Science."

[From *The American Christian Review*, Cincinnati, Ohio.]

The author, a man of acknowledged genius, and confessedly the brightest scientific star of modern times, has startled the religious world into transports of joy and praise. No religious-scientific work has received both from the secular and religious press such willing and unqualified praise as *The Problem of Human Life*. It is the death-blow of atheistic science.

## "The Mightiest Scientific Revolution ever seen."

[From *The Journal and Messenger*, Cincinnati, Ohio.]

*The Problem of Human Life* is a very unexpected contribution to scientific polemics, which, if its reasonings shall be justified, on thorough investigation will prove to be one of the loftiest achievements of this age, and effect one of the mightiest scientific revolutions ever seen.

Canvassers will be supplied free of cost with bundles of the *Microcosm*, on application, to enable them to leave copies with intelligent families. For information both as to the book and the paper, address the Editor, 83 Park Row, New York.

Press of H. B. ELKINS, 13 and 15 Vandewater Street, New York.

# The Microcosm

A MONTHLY JOURNAL OF SUBSTANTIALISM AND COLLATERAL DISCUSSIONS.

THE ORGAN OF THE SUBSTANTIAL PHILOSOPHY.

**A. WILFORD HALL, Ph. D., LL. D., Editor and Proprietor.**

(Author of the "Problem of Human Life," "Universalism Against Itself," Editor of the *Scientific Arena*, &c., &c.)

**ROBERT ROGERS, S. L. A., Associate Editor.**

Address all communications to A. WILFORD HALL, 23 Park Row, New York.

Vol. VI.—No. 8.

JULY, 1889.

50 Cents a Year.

Entered as second class matter at the New York Post Office.

## Fallacies of the Wave-Theory of Sound, No. 3. Sympathetic Vibration Explained.

BY THE EDITOR.

Of all the arguments claimed to favor the wave-theory of sound, as set forth in the textbooks, and as taught in all the colleges, that based on sympathetic vibration is regarded as the most demonstrable.

By "sympathetic vibration" is meant the responsive tremor of a stretched string, for example, caused by sounding a note in unison with it and in close proximity to it. Such tensioned string or other sounding body, as is well known, will not only vibrate visibly in response to such unison tone, but it will itself go on vibrating and producing sound after the actuating body has been removed or stopped off.

Advocates of the wave-theory claim to see no possible way of explaining such unisonant or sympathetic effect except on the assumption that air-waves, of a corresponding vibrational number, are sent off from the actuating instrument which strike the unison instrument, and by successive impacts, in synchronism with its own tendency to vibrate, gradually start it into a corresponding movement.

To the superficial observer such explanation appears plausible if not altogether conclusive. But to the Substantialist, who looks below the surface of things to the real and essential elements of cause and effect, its explanation by means of air-waves or atmospheric pulses is not only inconclusive but positively fallacious and absurd. And so positively do we regard every phase of sympathetic vibration as opposed to the wave-theory, that if we were limited in a debate to a single argument against that doctrine, we would unqualifiedly select this class of acoustical phenomena as constituting our choicest weapons.

Indeed, so strongly to our mind does the very idea of sympathetic vibration bear against sound as a mode of motion, and in favor of sound as a substantial force or an immaterial, objective entity, that we feel able to show that several of its most definite phases constitute distinct mechanical demonstrations against the former, and in support of the latter position. Let us look at only one or two of these physical aspects of sympathetic vibration in this article.

In an issue of *Harper's Young People* some time ago, a popular writer on sound was endeavoring to prove and illustrate the wave-

theory by these well-known effects of sympathetic vibration, and among other things which he gave as sober facts, was the following:

"The first iron bridge ever built was that at Colebrooke Dale, in England. While it was building a fiddler came along and said, 'I can fiddle that bridge down.' The workmen, little alarmed, bade him fiddle away to his heart's content. Whereupon the musician tried one note after another on his instrument, until he hit one in tune with the movement of the bridge, and the structure began to quiver so perceptibly that the laborers begged him to cease and let them alone, which he did; otherwise the structure would surely have fallen."

This narrative was not only given as a deliberate and serious statement of fact, in every way in harmony with the wave-theory of sound, but it has been copied into most of the papers of the country for actual truth. Yet as we will soon show, a more egregious and self-evident absurdity never came from the brain or pen of a sane writer.

Now these extreme sound-theorists, as we have often shown in the *MICROCOSM*, take a few grains of truth from the science of acoustics,—facts which actually occur to our observation,—and then proceed to weave out of them and into them any amount of ridiculous romance, leaving the inference to the uninformed that the most monstrous and far-fetched impossibilities must necessarily be accepted as true just because the observed facts exist. Let us look at the question of sympathetic vibration for a moment in the light of the foregoing extract, and try to sift from a few grains of truth the self-evident absurdities of its teaching.

It is true and well-known, as just intimated, that a note of a given pitch sounded in close proximity to a stretched string or other tensioned body timed in exact unison, will cause a response in such unison body, or awaken in it a corresponding vibration, but remember that *in every possible case such awakened vibration and responding tone can only reach a very small fraction of the amplitude or intensity of the vibration and sound which caused them.* Bear this infallible law in mind, as we shall use it presently.

In numerous places in our former writings we have presented considerations against the current interpretation of this phenomenon, one of which we here repeat with some elaboration. To show the fallacy of the view of wave-theorists,—that sympathetic vibration in

a unison string is caused by the impact of consecutive air-waves from its fellow,—we have only to take two such vibrating strings tuned below a sounding pitch,—say that they make only six or eight vibrations to the second, so as to enable the eye to follow their oscillations distinctly to verify their exact synchronism,—and then placed them side by side on separate supports with only the free air connecting them; and it matters not how accurately their vibrations shall occur in unison, or how vigorously one of the strings may be excited into action, or how closely these strings may approximate each other throughout their entire length so they do not touch, yet no motion whatever will be excited in the string at rest by the supposed air-waves from its vibrating mate. Why? Simply because these atmospheric pulses are unaccompanied by the corresponding pulses of substantial sound-force, which are the sole cause of sympathetic vibration.

Plainly, if it be simple air-waves sent off from the vibrating string, when tensioned to the sounding pitch, which cause its unison mate to respond into action, then a similar response should occur by similar air waves even when no accompanying sound-force can result. This we will demonstrate in a moment by the claim of wave-theorists that unison bodies, even of one oscillation a second, will exhibit the same sympathetic action upon each other as will sounding strings. We again assert that no wave-theorist can give any sort of reply to this proposed experiment of two vibrating strings tuned in unison but below the sounding pitch. Let any of them try it.

But in the light of the theory of sound as set forth in the Substantial Philosophy, which teaches that sound is a substantial but immaterial force analogous to electric discharges, the whole mystery disappears. These pulses of substantial sound-force coming in contact with the constituent elements of the sounding body potentially in condition by suitable tension to respond, will awaken in such sympathetic body its latent sound-force by successive impacts till its vibrations become visible and its own sound becomes audible.

According to such substantial view of sound this peculiar form of force is not generated or liberated from the force-element of nature by every vibratory or oscillatory material body, nor is the same intensity of sound produced by all bodies of a given superficial area even under exactly similar rapidity of vibration and amplitude of swing, though sending off the same air-waves precisely, as so frequently shown in the MICROCOSM, thus conclusively proving that sound in no possible sense depends upon air-waves as it cause.

Indeed, we here make the prediction, though we have not tried the experiment, that a perfectly rigid piece of metal, an inch or more wide, may be made to vibrate bodily, by suitable machinery with an amplitude of a quarter of an inch, but without any disturbance of the cohesive force among its particles, even to forty vibrations a second (E. of the double bass) without producing the slightest tone, though its atmospheric pulses sent off will exceed a hundred fold those of that most powerful instrument of the orchestra. We are ready to show how such experiment can easily be tried if any physicist, having a few spare dollars, wishes to help explode the wave-theory.

As intimated before, it takes a certain ra-

pidity of vibration, or succession of oscillations per second of a body having the suitable sonorous property as well as suitable action among its particles and corresponding disturbance of its substantial cohesive force, to liberate the substantial form of force we call sound, and which in turn is capable of producing the objective sympathetic effect of visible vibration in a unison chord and the subjective sensation of sound in its action upon our auditory nerves. This subjective effect of a sonorous pulse is its secondary meaning according to the very first questions and answers given in our "Text-book on Sound."

Thus the substantial force of sound, as a real entity and by its real contact, analogous to the action of substantial electricity, produces both its objective effect on the string and its subjective effect on our nerves. And it is no more a mystery why a slow vibration does not liberate this force, than why a slow rotation of the dynamo cylinder of magnets does not generate electricity. In this latter case the rotation has to be sufficiently rapid to cause the magnetic poles to pass swiftly enough by each other in opposition to their attraction, *to rupture their magnetic force and thus transform it into electricity.* This, for the first time, as we believe in the history of dynamo-electricity, though incidentally confronted, explains how this force is generated by means of the dynamo-machine. That is to say, electric force is but magnetic force ruptured and disintegrated by dynamically and abruptly tearing the magnets away from their sympathetic relation to each other; while magnetism produced by electric currents in the iron or steel is but the reconversion of the electric into the magnetic form of force.

To deny this substantial view of sound as here presented, on the plea that we do not see how it is possible for an immaterial substance, as sound-force is claimed to be, to move a material body into sympathetic vibration, is to shut our eyes to the analogous and well-known fact that the substantial but immaterial magnetic force, radiating from a magnet, will seize a piece of iron and lift it bodily even in opposition to the counteracting force of gravity. And it is no more mysterious that this substantial sound-force should act most sensibly only on another sounding body in unison with its pulsations, than that magnetic-force should act most sensibly only on iron or other forms of metal most nearly tuned, so to speak, in magnetic unison with the actuating force of the magnet.

Thus we have in nature and in the mechanic arts, right at our finger-ends, a complete analogue of the action of sound as a substantial force and without any possibility of air-waves in the premises, as here illustrated, by the action of a magnet on a body tuned magnetically in sympathetic relation to it.

This fact, taken in connection with the demonstration just pointed out, that no action will be produced on a unison string by the vibration of its mate if both are below the sounding tension, ought to convince the most sluggish intellect that has received an elementary training in physical science, that air-waves have nothing whatever to do with causing sympathetic vibration. It will be inexcusable on the part of our college professors, after their attention shall have been called to this argument, should they neglect for a single week the experiment here pointed out of testing two



strings tuned in unison below the sounding pitch,—say six or eight vibrations a second,—thus to test the effects of air-waves pure and simple as a cause of sympathetic vibration. Do these professors desire to reach correct scientific conclusions? If so, let them try this experiment; otherwise let them burn this paper and try to suppress the MICROCOSM.

We now come to the fact intimated a moment ago, that wave-theorists have no right to repudiate our test of unison-strings at a low vibrational number on the ground that they will not produce tone; for they themselves actually tell us that one clock-pendulum will be started into oscillation from a state of rest by the air-waves sent off from another clock-pendulum in close proximity and of the same rapidity of oscillation. The authoritative writer in *Harper's Young People* just quoted, gives this view about as it is usually laid down in our textbooks on acoustical science. He says:

"When two clocks whose pendulums have the same range of vibration are in the same room, and the clock doors are open, if the pendulum of one is set in motion the pendulum of the other will also move. This is the reason: every time the pendulum of the clock vibrates it sends a puff of air in the direction of the pendulum of the second clock, and these puffs, continued regularly, set the pendulum of the second clock going."

How many innocent minds all over this country have been gulled into accepting the wave-theory of sound by this stupid bosh about a clock-pendulum sending off "puffs of air" to start another clock-pendulum in oscillations? Yet in the face of this high authority, Prof. Tyndall, in his "Lectures on Sound," declares that the pendulum of a clock moves so sluggishly that no condensed pulse or "puff of air" can be driven away from it, because the air-particles in front have time to slide out of the way and take their place behind the pendulum without being condensed. Prof. Helmholtz and, in fact, all leading physicists concure exactly with this view. Yet, after such a common-sense statement as this, it is a suggestive fact for the probable correctness of this consistent wave-theory that Prof. Tyndall himself in the very same book repeats this identical mother-goose fiction as a veritable fact in favor of the wave-theory as last quoted from *Harper's Young People*, namely, that one pendulum will actually set another of the same length into vibration if placed in close proximity.

Thus, how beautifully the wave-theory hangs together in the hands of these master mechanics and world-renowned physicists! The pendulum, they say, can not condense the air in front of it, or send off a pulse on account of the slowness of its motion; yet it will start another pendulum into motion by means of the "puffs of air" or condensed waves it drives against it!

Now we assert, as we did of the two unison strings tuned below the sounding tension, that there is not one word of truth in this whole fable of one pendulum starting or stirring another, however near together they may be placed, so long as they are attached to separate supports with nothing but the free air connecting them.

In the light of this analysis, how preposterous must appear to the reader the story of the fiddler once on a time producing a panic among the workmen who were building the first iron

bridge across a river in England! If any English mechanic ever became alarmed by the possibility of a fiddler disturbing such a structure as here described, he must have been a distant relative or a warm adherent of Prof. Tyndall.

Now it so happens that these eminent physicists who deal in such illustrations as sympathetically destroying an iron bridge by producing a certain tone on the violin, have never taken the trouble to think or they would know that to produce any sympathetic vibration whatever, the entire bridge must be tensioned in unison with some tone possible to be made on the violin. To be thus tensioned it must be approximately of the same length and weight as the string itself, or otherwise no unison could exist between such bridge and one of these violin strings. The impossibility of tuning a bridge built across a river—several hundred feet long and weighing many tons—in unison with one of the strings of a violin, needs only to be hinted at to a man of ordinary intelligence to expose the absurdity of the idea. It is on a par with the almost similarly grotesque view as given by Helmholtz, Tyndall and all the other high authorities in acoustics, that the so-called *Corti* microscopic rods in the inner ear—only the one-three hundredths of an inch in length—vibrate by unisonant sympathy with every string of a seven-octave piano, including its bass wire chords four or five feet in length, and by which we are enabled to distinguish their different tones. The utter impossibility of such results we fully exposed in the "Problem of Human Life," and thus demonstrated in several different ways the monstrous fallacy of tympanic vibration as the means by which we hear sound.

But here we reach the culmination; for even if the bridge in this *Harper-Young-Folks* fable had been so small as to be capable of unisonant tension in sympathy with a fiddle-string, still its sympathetic vibration, at a distance of a foot from the fiddle, in response to the loudest possible tone the musician could have produced, would probably not have been more than one-hundredth part the amplitude or width of swing produced in the actuating chord itself. What prodigious nonsense, then, to suppose that such an infinitesimal fraction of the actuating tremor of a violin-string as reproduced in sympathetic vibration could have been capable of destroying an iron bridge substantially built over a river! Query: If the one-hundredth part of a fiddle-string's vibration would be sufficient to destroy this bridge, why does not a hundred times as much vibration of the string itself destroy the fiddle and disintegrate the fiddler? The echo of the fiddle-string answers—"Why?"

PRIZE ESSAY, No. 11.  
Moons and Cosmogony.  
BY DR. J. F. LUKENS.

Whereas, much speculation and difference of opinion appears to exist relative to moon-potency, and poor Cynthia is about denied all her whilom reputed power of curling up shingles and pulling out fence posts; therefore, I have come to her aid to show that she, or she in conjunction with her putative sisters, may, in times past, have been very needful functionaries in giving some final touchings and finishings to this little earth we inhabit.

Prof. Bell, of England, is of the opinion that our present moon at one time revolved in

about the one-sixth part of her present distance from the earth. And perforce of increased attraction as the squares of distance diminish, would raise tides near six hundred feet high, sufficient to inundate about all the present dry land; and that the flowing and ebbing of such tides formed and deposited the beds and strata of sand and gravel found on or beneath the surface of all parts of the globe yet trod by civilization. We find marine shells in the hills and mountains; pretty good evidence that old ocean has been there.

The foregoing would seem reasonable and subservient to the accomplishment of the work if we had some good plan to make Luna "git out" and become peaceable when she had agitated the waters long enough; but unfortunately for the hypothesis we have none; while, on the contrary, the tendency of the secondary planets is *towards* their superiors; into which they are destined, no doubt, eventually to fall.

With all deference to Prof. Bell, we think his hypothesis will have to be abandoned and some other brought into requisition to make the waters work awhile and then relapse to their present status. The whole difficulty is easily solved, by supposing the earth to have had one or more other moons with orbits inside that of our present moon, and by their proximity to the earth, raise tides adequate for all the water work of which we have evidence in and on the earth,—which is no preposterous supposition—other planets have plurality of moons.

Some may naturally inquire what has become of these hypothetical, and now, lost moons. I have in mind a very useful place for them; let them fall to the earth in fine pieces; when the tides they had raised would cease, and the earth become fit for vegetables and dry-land animals.

Should any one think this vague or wild supposing, I refer him to the thing itself going on at the present time on a small scale; I refer to the falling of meteoric stones. Astronomers say meteors are the fragments of a planet or planets in space within the earth's influence. Fragments of a planet demonstrate a planet was. No one knows how large a planet, or how many, or when the fragments were made, or when they commenced coming, or whether they may not, in the long past, have been coming more copiously than at present.

These supposed planets (moons), few or many, large or small, as the case may have been, I will suppose to have been composed of clay and boulders, as we have them here, which on striking the earth's atmosphere would disintegrate and shower down nicely over the gravel as we find at the present day; conforming to the shape of the underlying gravel; conclusive evidence that it has been showered down, or got on some way without disturbing the gravel.

We don't think that all portions of the earth have yet had the benefit of moon sprinklings; for instance, the sandy deserts of Asia, Africa and Oceanica. If these sandy deserts were covered over a few feet thick with clay it would soon be growing vegetation and the sand beneath filled with water, all for the support of animal life.

No doubt but our fertile country would have been a barren waste, were it not for the clay,

and organic matter produced since the clay was in place.

Geologists say there was a time when this earth was primitive rock, in a molten state; which eventually cooled down and hardened; and that clay is made by the attrition of this rock by the action of water and atmosphere; if so, it could not have been made in its present position without disturbing the gravel; then some plan to make it and how to get it to place, become posing questions not answered by the geologists. But if we have the clay in planets revolving round the earth, pulling up high tides and manufacturing and putting the gravel in place, and then immolate themselves on the scenes of their labors, the tides they had raised would cease, the land become fit for vegetable and animal life: then the hypothesis becomes reasonable and possible without violating any law of matter.

Again, what could bring "fragments of planets in space within the earth's influence?" Just one natural cause, and that would be to lose their equilibrium and fall to the earth, which would break up a planet of clay into fine powder.

Had Luna been cavorting round within forty thousand miles of the earth for a few thousand years, she would probably have done the work attributed to her; had she then skipped out to her present domain, she would have left the whole earth a sandy desert, similar to Sahara or Cobi. Some other moon or moons would have done the work equally well, and could have been utilized to a better purpose than being driven two hundred thousand miles away, contrary to reason and natural law.

The nebular hypothesis of Laplace supposes the solar system to have been a nebula (substantial corpuscles) occupying the expanse inside the orbit of Neptune, perhaps, "which, gradually cooling and contracting in accordance with natural laws, threw off rings," etc. I demur to this throwing-off process for planets, because it is contrary to natural law, reason, or necessity.

The law of atoms is that each atom has a substantial attraction for every other atom in the universe, but a special attraction for its next neighbor; if by any chance two or more atoms should come in contact, a nucleus, an embryo planet would be forming, with a continually increasing attraction to all others in its vicinity. Suppose again, that numerous nuclei should synchronously begin to form and gather up the nebula into planets; the one at or near the centre of the material would have advantage over any others and be a sun, holding the others in control; while those at considerable distances might acquire sufficient stability to maintain their self-hood for a long time and be able to hold moons in control.

We are of the opinion that none of the moons or planets ever get away from their superiors, excepting in their periodic eccentricities, in which case they always return at the proper time; but on the contrary, all have an unceasing disposition to go to their superiors, which trip they are all destined to start on, the instant their centrifugal force fails to counter-vail the substantial centripetal power pulling them to a common centre.

West Mansfield, O.

Do not forget your friends at a distance, but send us their names on a postal card, so we can send them free sample copies of the Microcosm, which we will gladly do.

**HABITS AND INSTINCTS OF ANIMALS.**  
**Does Darwinian Evolution Account for Them?**  
 BY THE EDITOR.

A person who observes and reflects as he passes through life can scarcely avoid astonishment at the thousand and one curious instincts and habits of animals of different species, everywhere exhibited throughout nature. We shall name only a few specimens of remarkable singularity in this article, reverting to the subject again in a subsequent number of the *MICROCOSM*.

A traveler in Sumatra, for example, found a species of very long-tailed monkeys, which employed their extraordinary caudal appendages for the purposes of crab-fishing. There existed along the sandy coast of that island a species of edible crab, which burrowed in perpendicular holes in the sand as a retreat for safety when disturbed in their sun-baths. One of those monkeys, from the adjacent woods, becoming hungry, would sally forth crabbing along the beach. If he could succeed in creeping slyly upon a sleeping crab before it had time to find its burrow, his dinner would be provided, but in nearly every case the wiley crustacean, sleeping with one eye open, would be too quick for his monkeyship and be safely ensconced in a hole too small and too deep for one of the monkey's arms.

But with an ingenuity worthy of his Darwinian posterity, his habit, as often observed by travelers, is to thrust his long and prehensile tail down into the hole till by means of its sensitive touch it finds one of the crab's open forceps and places the tip of the tail directly between the jaws. This always proves too great a temptation for the crab not to take advantage of and fasten upon in dead earnest. Notwithstanding the intense pain produced by this vigorous closing of the forceps, the monkey heroically bears it and with all the fortitude which a philosophical instinct and an empty stomach will inspire, though at the same time giving vent to the most pitiful groans and agonizing contortions which no doubt serve to inspire the crab with the utmost confidence that he has got his monkeyship secure enough. All this while the writhing monkey is patiently but gently engaged in drawing the crab toward daylight, till finally, by a sudden twitch of his tail, he lands the astonished victim before it has time to come to its senses sufficient to realize the ingenuity of the fatal trick.

But ingenious as this appears to be, it does not exhibit the mechanical skill and calculation evinced by the South American bridge constructing tribe of monkeys, which have so often astonished travelers, where a string of eight or ten monkeys suspended from the limb of a tree will cling to each other's hands and feet and then work up a pendulous motion till the lower one can reach the accurately calculated limb of another tree on the opposite bank of the stream, thus forming a safe bridge for a whole troop to pass over one at a time. After all have thus landed safely on the opposite bank, the first one of the original string, letting go his hold, will become the lower one of the inverted string and will make his way up his fellows to the limb above, followed in succession by the others.

This, perhaps, is one of the most ingenious habits of all the monkey tribes, and is relied upon by evolutionists with great confidence as a strong inferential proof that the monkey, in

the scale of development, was not very far below the more inferior tribes of men. But this inference, plausible as it appears, is not very cogent, since tribes vastly lower than the monkey, as evolution teaches, show skill and wonderful instinct which throw these monkey tricks entirely into the shade.

As an illustration, take the wonderful exhibition reported from the upper waters of the Missouri River, of a species of water snake known as "fishers." This snake is provided with a sharp, forked, bony hook at the end of its long and slender tail, which it uses for catching fish. But the most surprising feature of this combined fish and snake story is, that the ingenious reptile often positively baits this hook on the end of his tail by attaching a grasshopper or other insect to its prongs in true fisherman style, and then lies motionless upon a floating log with the end of his tail slowly vibrating beneath the water's surface, till a passing fish seizes the bait, and by a sudden twitch of the snake's tail, fish and all is whipped into his mouth.

It is also reported, by those who claim to have observed its habits, that this fishing snake sometimes hooks a fish too big to land, or even to swallow if landed, when other snakes of the tribe will come to its assistance, and by coiling their tails around the game will jointly pull it upon the log. If, after an apparent war-council, it shall prove too large to devour, it is unhooked and allowed to return to its native element.

Now, this story would almost seem incredible, had we not, at least, partially corroborative evidence in the habits of other animals. A pet fox, for example, which we knew of when a boy, would crumble a piece of bread given to it and scatter it all around the door of his kennel to attract chickens, and then would lie apparently asleep till a chicken would venture near enough to be caught.

But the great problem of the fishing snake, so positively described by Dakota investigators, is the unmistakable design and adaptation of the forked, bony hook on the tip of its tail, to the sole purpose of catching fish and of holding bait for that object. Evolution, which, according to Darwin, only acts by infinitesimally slow stages of development, each variation, however slight, being of use to its possessor, can never explain the ingenious development of this hook by slow stages, which could have been of no possible value to the snake till sufficiently evolved to hold a fish. We prefer to believe that this snake, with its fish-hook tail as well as its marvelous instinct for baiting the same, if the story be true, was the special work of a designing and intelligent creative will. No wonder that the devil assumed the form of a serpent, as the most subtle of all the beasts of the field, when he played his ingenious, though disingenuous, trick on our good mother Eve, that is, if the scripture account is to be taken literally.

We believe, however, that we can discount even the strange narratives here recorded, in the habits and instincts of a certain lizard, called by the natives a *swift*, which came under our own observation, when a boy, in Steuben County, in this State. While hunting for squirrels in the bushes, and when sitting quietly on the ground, we observed one of these bluish-green little reptiles, about five inches long, to come toward us over the leaves, flitting hither and thither with a rapidity of move-



ment that was surprising, and which wonderful celerity of motion evidently gives it the name it bears.

With our natural curiosity for the wonders of animal instinct, we watched this little creature's singular antics for some minutes, till it occurred to us, if its movements were so swift in its normal occupation, what must they be in velocity if frightened, and if it were made to run for its life? With this thought we gave a sudden spring and simultaneous shout, and to our amazement it dropped about an inch of its tail, as an evident ruse to prevent our pursuit, and darted away like an arrow shot from a bow.

This section of its tail which was about a quarter of an inch in diameter at the body end, squirmed and wriggled with the same dexterity of movement that the whole lizard had exhibited before, and kept it up incessantly for more than a minute, when it suddenly subsided into quiescence.

Having at once suspected the nature and object of the trick we lost no time in examining the stump of this tail-section of the lizard which showed life all the time, and though it appeared bloody like raw flesh as if it had been squarely severed with a knife, still to the touch it was smooth, dry and even glossy!

Leaving it, however, for a short distance, and hiding ourself in order to watch the denouement, we had not waited long till the same tail-less lizard returned, cautiously reconnoitering the situation for its lost property, when it at last approached the missing-link, and as suddenly as the springing of a trap the two parts flew together and the reconstructed reptile went on its way apparently as sound and able bodied as before.

May we not add that wonderful as are the strange habits and instincts of certain animals narrated in Darwin's "Origin of Species," he relates nothing at all equal to this "Swift" incident, for which we can positively vouch from personal observation and memory, though it occurred more than fifty years ago.

What less, we ask, than special miraculous creation, by infinite wisdom, could have implanted this instinct and capacity in an animal for the separation of its own body to serve the struggle for life, and then the instinctive co-operation of both parts again to coalesce after the danger is over? Surely the law of evolution by natural selection, as repeatedly defined by Darwin, could not have led to it, for as before remarked, such evolution, he says, "acts by slight successive variations," all tending to the final organic improvement of the creature, and each variation, however slight, for the benefit of the organism under its environment. (See "Problem of Human Life," chapters 8, 9, 10 and 11.)

In the name of reason, how could "natural selection and survival of the fittest" have saved up these slight successive variations in this species of lizard with a view to its final ability to drop its tail in case of danger, and then restore it again at leisure, when not one of such incipiental variations would have been of the least benefit to its possessor till the entire tail-dropping process had been completed?

Darwin, if asked, would have been obliged to admit this tail-dropping lizard to have been one of the "few forms" which, as his theory assumed, required the intervention of a personal and intelligent Creator. Is it possible that he had never heard of this lizard? Or is

it not more likely that he knew of it, but preferred not to introduce a species so puzzling, and with the development of which he knew his law of "natural selection and survival of the fittest" could have had nothing to do?

There are many other exhibitions of marvelous instinct in lower animals which we could name, equally inexplicable by this so-called law, and equally requiring intelligent creative power for their development and adaptation to the uses they serve in the animal economy. Take one more instance of our own early discoveries involving the strange combination of instincts in two co-operating species which we have never seen referred to in any work on natural history.

It is the remarkable habit and association of a certain species of large humming-beetle, popularly known as the "tumble-bug," whose chief aim in life seems to be to construct a ball, about three-fourths of an inch in diameter, out of almost any animal manure, and then in the early evening to roll it for dear life along any smooth roadway it may happen to find without any apparent or definite destination in view.

Curiosity once prompted us to test the mental capability and working of this strange animal; so we pushed it away from its ball, finally turning it upon its back, when precisely like the opossum, it at once stiffened its legs and feigned death as an evident inducement to be let alone by the intruder. Further to facilitate this deception, we observed a swarm of minute and delicate yellow parasites scarcely larger than the period point at the end of this sentence, sallying forth from under the secret folds of the beetle's shell, covering its entire body as with a sort of decayed mildew. These tiny insects, true to the part they had to play in the drama of deception, busied themselves apparently in devouring the carcass of the dead beetle, till finally, after all had been silent for a while and the "tumble-bug" had thus been led to suppose that the intruder, whoever he might be, had passed on, a shake of its legs gave the preconcerted signal, when, as if by magic, every parasite had sought the hiding place from which it came, and the beetle proceeded to right his ponderous body and again rear its hind-parts against the ball in his process of tumbling as before.

The query with us has ever since been: are these minute insects employed in mental co-operation with the wishes of the beetle, and do they by instinctive concert act their part in the deception described, or are they mere parasites indigenuous to that species of beetle, which are caused first to sally forth from their retreat by a death-like odor which the beetle emits when the opossum-act begins on purpose to deceive the parasites? And second, is their sudden disappearance at the first sign of life on the part of the beetle, caused by another kind of emitted odor which frightens them into retirement? This is a problem which some philosophical entomologist would do well to investigate and solve, if it can be done.

The observation we have last described can be made in any farming part of the country, by any one curious to verify our statement. One thing is sure, that whatever co-operation exists between the beetle and its assistant parasites, this entire combination scheme of deception, in the struggle for existence, is much more naturally and easily explained as the work of intelligent creation and adaptation

of means to ends than on the basis of blind and unintelligent natural laws.

#### A Question in Relation to Longitude and Time.

BY PROF. J. A. TIMMONS.

Suppose it is ten A. M. on Saturday, May 18th, at Fort Dodge, Kansas, in *west* longitude say  $99^{\circ} 45' 45''$ , what day, and what hour of the day, is it at Madras, India, in *east* longitude  $80^{\circ} 14' 15''$ , which is at once  $180^{\circ}$  east and  $180^{\circ}$  west of Fort Dodge? If we count eastwardly, the time at Madras is twelve hours *faster*, that is, ten o'clock *Saturday* night; if we count westwardly, the time at Madras is twelve hours *slower*, that is, ten o'clock *Friday* night; but at the same place it can not be both nights at once; which night is it in reality, Saturday or Friday? A place  $60^{\circ}$  east of another place is four hours faster; one  $60^{\circ}$  west of it is four hours slower; at  $120^{\circ}$  east it is eight hours faster, at  $120^{\circ}$  west it is eight hours slower; likewise at  $180^{\circ}$  east it ought to be twelve hours faster, and  $180^{\circ}$  west it ought to be twelve hours slower; but this will make two different times at the same place, which can not be; which time is the right one, and what explanation does the *international date line* throw on the matter?

St. Mary's, Ky.

#### The Real or Substantial in the Forces of Nature and in the Spiritual World.

BY J. W. LOWBER, PH. D., LL.D.  
NUMBER II.

The following articles are a condensation of a chapter in the author's new book, "The Struggles and Triumphs of the Truth."

I will now direct your attention to the argument from analogy. It amounts almost to demonstration. The word analogy is derived from the Greek *ana* equally, and *logos* speech or reason. It denotes a parallelism between things which, in some respects, differ. When the difference is small, and the resemblance very great, the argument from analogy approaches the strength of a valid induction. This method of reasoning is very impressive, and its value is universally acknowledged. "Butler's Analogy," one of the greatest works in the English language, is a demonstration of this fact.

God has given man at least five senses by which to become acquainted with things external. So one of these senses should be studied without direct analogical reference to the others. In every case it is necessary to distinguish between sensation itself and the object which excites the sensation. Some writers have been very reckless along this line and have not given proper attention to definition. The organ of smell and the smell of a rose are different things. The act of inhaling the odor is not synonymous with the odor inhaled. The act of smell, apart from certain physiological questions connected with it, is familiar to all. The character of odor itself is not so well understood. It is admitted by all to be a kind of effluvia emanating from the odorous body, and coming in contact with the nervous organism. Dr. Carpenter claims that odor consists of particles of extreme minuteness, dissolved in the air, and mostly volatile; yet he admits that the most delicate experiments have failed to discover any diminution

of weight in musk and other similar substances by the odorous emissions. But whatever these odorous emissions may be, it is admitted by the most eminent scientific authorities that they are substantial objects of smell, which is a refined modification of touch. The atmosphere is only the vehicle by which the object is brought in contact with the olfactory nerve.

The principal characteristics of the sense of smell are also common to those of taste. God has given man the organ of taste, and something substantial to satisfy the demands of this organ. The vapid substances, which are emitted from the body, are brought in contact with the nervous organism and excite the sense of taste. It would not be possible to satisfy taste with anything unsubstantial. We expect the substantial in this life and in the life to come.

Many of the characteristics of smell, taste and touch also belong to hearing and seeing. All the senses are, in fact, a modification of touch. In seeing and hearing, as in taste and smell, it is universally acknowledged that the objects which excite these sensations are substantial. If that be true, why is there not also something real in light and sound, which are likewise objects of sensation? As all are modifications of touch, if part are substantial, it does appear to me that analogy requires us to conclude that the others are also substantial. The experiments of Tyndall and other physicists prove to my mind that there is something real in the forces of nature. In fact, there can be no motion without something to move.

Fort Worth, Texas.

#### PRIZE ESSAY, No. 12.

##### The Primordial Fountain of Force.

BY REV. J. J. SMITH, D. D.

Force, which is so essential to all the processes of nature and which is so manifest to our senses, and so protean and universal in its operations, is, nevertheless, in many respects, a very great mystery. How little we know about electricity, save its marvelous manifestations, or even of gravitation that is so constantly under our every day's observation, or any other of its various forms. It is known, however, to be an imponderable, indestructible, immaterial, ever present, and energetic substance, or in other words, a *substantial active entity*. Hence it is in no sense a property of matter, for matter is inert. "There is," says Faraday, "one wonderful condition of matter, perhaps its only true indication; namely, inertia." Besides, if force were a property of matter, every particle of matter would possess it. But that it does not, is evident, from the fact that, if all matter were annihilated but one atom, that atom, as a matter of course, would not possess gravity or any other force.

Again, all forces being immaterial and consequently unlike matter in every respect, how could force, essentially, belong to it, or originate from it? Could the material be father to the immaterial? Furthermore, that the *vis viva*, one of the forces is not a property of matter, but that it is essentially different is manifest in this, that at the moment of death, although the physical still remains, and even organization for a time, the vital force departs, and absolute inertia takes its place.

In addition to this, force is vastly superior to matter. Although invisible, it is, neverthe-

less, one of the most unmistakable and pronounced substantial primary entities in the universe. It is the great organizer of matter, and is everywhere and constantly controlling it, from the invisible molecule up to the mightiest orbs of heaven. Now, it is plain that if matter originated this force, the less has produced the greater; or, if force in any sense is a property of matter, it follows that an element or adjunct, is superior to the body itself, which is absurd. This superiority of force to matter is still more apparent in its higher forms. It is utterly incredible that the vital, mental, and spiritual forces should be matter-born, when their properties are so diametrically opposite. The difference between mind and matter is vital and radical.

Nor is force, as claimed by some, a mode of motion. All motion must be the result of force. They necessarily sustain to each other the relation of *cause* and *effect*. But if force were motion, it would follow that force produced itself, and also that they were both one. The idea of self-production, however, is too absurd for consideration. Nor can that oneness be entertained. Motion is often transitory, as when a moving body comes to rest, and, therefore, it is not an entity. But force is abiding. Although it may in many cases seem to be lost or dissipated, it is only because we fail to trace it. Furthermore, force often antagonizes, resists, and thereby destroys motion. But in such cases, if force be a mode of motion, it destroys itself. As this can not be admitted, it necessarily follows that force is not itself a mode of motion.

There is, however, as we believe, a grand and philosophical solution of this problem which is reached by referring all force wholly to the Divine Being as a direct emanation from his own omnipotent energy, and as the express purpose of His will. There must be in the very nature of things, a primary and abiding cause of all phenomena. This view is essential to a philosophical scientific basis of thought. Even Mr. Spencer writes: "By the very conditions of thought we are prevented from knowing anything but relative being; yet, by these very conditions of thought, an indefinite consciousness of Absolute Being is necessitated." Hence, while denying the possibility of knowing the Absolute Being, he is at the same time compelled to admit the universal consciousness of such a reality as the most important and certain of all philosophical truths. Hence, while force under the forms of gravitation, chemical affinity, heat, light, electricity, together with the vital and mental, is multitudinous in its manifestations, it must have its origin in God. And this idea is strongly reinforced by the remarkable unity that obtains among these various forms of force, as is proven by what is called the correlation and conservation of forces, as when heat is converted into light, or into electricity, or into magnetism, or chemical affinity; just as electricity can generate heat, light, magnetism, etc. A great portion of our muscles contract and relax in obedience to our wills, thereby proving that even the *mental* force can be, and is, in every such instance, actually converted into the physical. This at once prepares the way to refer all force back to an intelligent *will* force as a philosophical necessity.

"If we have traced one force," says Wallace, "however minute, to an origin in our own will, while we have no knowledge of any other

primary cause of force, it does not seem an improbable conclusion that all force may be *will* force, and thus the whole universe is not only dependent on, but actually is the will of higher intelligences, or of a Supreme Intelligence." (*Natural Selection*, p. 368.)

Besides, there is such a wonderful display of intelligent and beneficent designs throughout nature, as to demand, as a scientific necessity, a final cause in an intelligent Personality directing and controlling their complicated operations. Surely the force or forces which produce intelligence, as in man, must necessarily be endowed with or directed by intelligence. Even if we could resolve those forces into material agencies, and it could be shown that these laws could be expressed in mathematical formulæ; the necessity of seeking their origin in an essential and *all-wise Being* would still exist. The truth is, all investigations of dynamics tend more and more to prove that all conditioned and relative forces have their origin and unity in the energy of a Creator, who "upholdeth all things by the word of his power."

"Science," says the Duke of Argyll, "in the modern doctrine of the conservation of energy, and the convertibility of forces, is already getting something like a firm hold of the idea, that all kinds of forces are but forms or manifestations of some one central force issuing from some one fountain-head of power. . . . And even if we can not certainly identify force in all its forms with direct energies of one omnipotent and all-prevailing Will, it is, at least, in the highest degree unphilosophical to assume the contrary—to speak or to think as if all the forces of nature were either independent of, or separate from the Creator's power." (*The Reign of Law*, p. 122.)

Thus modern science has discovered a philosophical necessity of approaching the grand standpoint of revelation, and is already enthroning Omnipotency as the final cause of all things. What Paul said eighteen hundred years ago about the fountain of unseen power or forces in nature, is now discovered to have been a most wonderful revelation. "The invisible things of Him from the creation of the world are clearly seen, being understood by the things that are made, even His eternal power and God-head." Here the invisible things are designated as *eternal power*, which is clearly seen in and through the *material*; and also that this power or force centres in God. There is evidence in the foregoing of an approaching harmony between *science* and *revelation* upon this great central truth, that is destined, as we believe, in the near future, to overturn the very foundations of atheistic materialism.

#### PRIZE ESSAY, No. 13.

#### Light as a Substantial Entity.

BY D. JAMES.

Homer, Isaiah, Solomon, David and Job spoke of light as a thing. Milton said, "Hail! holy light, offspring of heaven, first born." Newton regarded light as a substance, until misled by the undulatory theory of sound. Dr. Hall having annihilated this theory, Sir Isaac will have to be classed with those great men, above named, who looked upon light as an objective thing, as it has always been regarded by the common sense of the world.

According to the undulatory theory, light is not a thing *per se*, but only a sensation pro-



duced, through the eye, by the motion of a subtle substance, called ether, pervading all space. In some way, this ether is agitated by the sun; the agitation is transferred or communicated to the optic nerve; and the mental impression produced by the motion of the nerve, is light. Light, heat, etc., are merely sensations caused by this ether, which is placed by its inventor entirely beyond the reach of human investigation. Its existence depends upon a mental conjecture. No one can ever find out whether there is such a thing really in the universe. Is not such a theory a begging of the question? Like an edict of an autocrat, it silences all discussion as to the producing cause of the phenomena of light, heat, sound, etc. We may discuss the phenomena, but a college of scientific dictators has decided to adopt the motion of ether as their cause, and any one, who expresses a doubt as to the existence of this ether, shall be tabooed as guilty of physical heresy.

This theory condemns Moses. That great law-giver should have represented the author of light as commanding: "Let there be motion of ether." Moses, being a prophet, should have foreknown that men would "seek out many inventions," and that, if he expressed an error, it would be detected. But, Moses, is still orthodox. He says the world was dark prior to the advent of light. Therefore, we must suppose and believe that the world was *illuminated* by the presence of light then, just as it appears to be now, although no eye was there to receive the "motion of ether." If it was not illuminated, and light is only motion of ether, the darkness must have remained after the promulgation of the divine fiat, for light being only a sensation of the agitated ether, illumination can not be predicated of the mere motion of so subtle a substance. Moses was correct: Light is a substance, gloriously beautiful, marvelous in its properties, "pure," "sweet," "of heaven the offspring first born."

The rapid motion of ether, necessary to produce the sensation called light, would destroy the eye, for the eye must receive the motion to have the sensation. The motion of ether, when its object is to produce the sensation called heat or the phenomenon called electricity, is terrible, but, when light is its object, which requires greater motion, the effect on the tender optic nerve is delightful and "sweet." But, this ether, this offspring of the guessing faculty, is sufficiently *elastic* to suit every case. What an accommodating invention! It is capable of explaining all phenomena.

But this elastic ether can not move itself. The agitation must have a cause, which is the *causa causarum*. The sun agitates the ether. How? We can't get there to find out. The ether itself is entirely out of the reach of possible discovery, and the cause of its agitation is 95,000,000 miles distant. There is no use in keeping the scientific dogs on that "trail" any longer—the game is out of reach.

We discover that light exists by the sense of sight. There are substances, doubtless, which are invisible, and whose existence requires proof; but light, being visible, needs no proof as to its existence, any more than any other object of vision. If light is only a sensation, let all objects which we see be the same. The term *sensation* will then be the talismanic word that explains all things.

Heat is discoverable by the sense of touch. If a man has coins in his pocket, he can know

the fact by feeling them. His eyes are not necessary to establish the fact. Just so with heat. We know its presence by feeling it. If heat is not a thing, but merely a sensation of agitated ether, the money in the pocket may be classed, for uniformity, with heat. The same mode of treatment may be applied to sound and odor. Our senses are altogether fallacious, and "things are not what they seem." Any theory which casts suspicion upon the testimony of our senses, may amuse the scientifically curious, but can be of no practical use to the truly scientific.

The science of physics teaches that matter is passive, and this passivity is intended to be expressed by the term *inertia*. This term is evidently used to express too much. It is stated that a body, put into the state of motion, will remain in that state by its inertia. At first, the body could not move because of inertia, but, now, it can not do any thing else for the same cause. An inert material body kept in motion by its inability to move! This is strange philosophy. It is evidently unsound, and we must account for the continued motion of a moving body in some other way, or it must be admitted that a body can move itself, which would be ignoring inertia altogether. The "*vis inertiae*" which will not permit a body to move when at rest, and will not permit it to come to rest when in motion, is the "baseless fabric" of an elastic imagination.

All motion of matter must be attributed to force, otherwise matter is not inert. If inertia is an established fact, then let that characteristic attend matter in every form or state. Wherever we find it, some force or forces are in possession of it and controlling it. What it would be or what condition it would sustain, if wholly divested of force, we need not conjecture. But we must avoid the awkward dilemma of predicating inertia, and then allowing a material body to move by virtue of its molecular activity. If a certain portion of matter is at rest, every part of it, "atoms" and all, is at rest. If the parts are in motion, the whole body should be in motion also; otherwise, there is a contradiction. This is a dilemma into which the molecular theory has fallen.

The cause of motion is force, and it is unscientific to relegate this cause to the domain of the unknowable, for "every secret thing shall be made known," and nothing is impossible to the man of faith. If Dr. Hall has found the key that unlocks the mysteries of the immaterial world, let us be glad, and lend a helping hand to open the door. Perhaps, this new philosophy will explain much that He said, who is the light of the world. The light which the founder of Substantialism calls a substance, is, throughout the Scriptures, used as the symbol of spiritual light. Both lights are substantial, and the gifts of God. Let us not put "light for darkness and darkness for light" by denying the existence of either. Our faith is a God-given force that "overcometh the world." It is not a "mode of motion," but a veritable thing. Love is also a force that binds together those who believe in that Light which "lighteth every man that cometh into the world." Thought is a force, which was perverted to a wrong use when the mode of motion theory was invented—a theory that leads inevitably to atheistic materialism. We should not desert our senses, and resort to some cabalistic method of explaining phe-

nomena, but use our natural powers in the light of faith, and every secret shall be made known.

We see light, feel heat, hear sound and smell odor; therefore, they are real objective entities. We can not see, feel, hear or smell motion or that which has no existence as an entity.

Vossburg, Miss.

#### A NEW BOOK BY DR. SWANDER.

We have lying before us a very pretty little volume, neatly gotten up, on good paper, well printed and tastefully bound, from the pen of our old and excellent contributor, the Rev. J. I. Swander, D. D., of Fremont, Ohio. This book, unfortunately, is so denominational in its character and subject matter as largely to preclude its general reading, thus in a sense circumscribing the fruits of mental ability displayed by the writer. The title of the book is, "The Reformed Church, a Sketch of its History, together with a Statement of its Doctrines, Government, Cultus and Customs."

Though strictly denominational, its narrative, culled from the highest contemporaneous authorities, of the various events in modern Church history connected with the origin, development, progress, and present establishment of the Reformed Church of America, embraces so many concomitant historical circumstances as to make the book of real interest to both the clergy and laity of all denominations, Catholic and Protestant, who care to be posted in the great questions of modern denominationalism.

The historic information directly and indirectly involved in the various discussions woven into Dr. Swander's able presentation of his own church organization, really tends to make the book more a matter of general interest to readers of religious literature than any strictly denomination book we have ever examined.

The doctor thoroughly understands his subject, and the knowledge of this fact on the part of the authorities of that church, no doubt, accounts for his selection for so important and authoritative a task as setting for the history and present status of that great denomination.

Then further, we strongly suspect that the other fact of the doctor's extensive popularity and acquaintance with ministers of all other denominations through his writings in the MICROCOSM, had no little part to play in his having been chosen as the mouth-piece or rather pen-piece through which Reformed Churchism should make its ample and justifiable appeal for popular favor to Protestant Christendom. This stroke shows true business policy on the part of the "Reformed Publishing Company," located at Dayton, Ohio, under whose authority and sanction Dr. Swander was the chosen man. We can only add that he has performed his task admirably and without a question better than any other man in that church could have done it. Besides its very careful analysis of facts and classification of the subject matter of the book into chapters and under appropriate headings, it has the rhetorical ring and literary finish of style for which Dr. Swander seems to have a patent.

The book is bound in cloth, contains 172 pages, 12mo., and will be sent by mail for 60

cents. Address the "Reformed Publishing Co.," Dayton, Ohio, or Dr. Swander, personally, Fremont, Ohio. EDITOR.

#### Does the Pendulum Stop at the End of Its Swing?

BY M. MILES.

On page 193, 1st Vol. of the MICROCOSM, Prof. John A. Kirby, of Flat Creek, Tenn., endeavors to prove by scientific arguments and illustrations that the pendulum or vibrating string does not rest at all, even for an infinitesimal time, when it reaches the end of its swing and starts back. "Suppose," he suggests, "that two bodies, one large and the other small, are moving slowly towards each other, and meet without compression or indentation, and that the smaller body turns back by the contact with the larger body, and moves with it without the larger body stopping—can there, by any possibility, be a period of rest, even infinitesimally short, in the smaller body?" I would say, it is all supposition to assume that any two bodies have ever existed or can exist, so hard or so soft, if they had cohesion enough to hang together, as to be entirely without elastic property. The secret of the turning back of the smaller body after coming to rest lies in the elasticity of the two bodies combined.

It is perfectly plain that each particle of the smaller body stops or comes to rest, before starting back. Not every atom stopping at the same time; but each particle of the smaller body stops, and moves back as fast as the tremor, jar, or shock-wave reached each and last atom of the returning body with sufficient force to stop it, and then all move along together.

The same thing he illustrates by a pitman saw where there is no play at all in the journal or joints. "How," he asks, "can the saw, when it reaches the extreme of its upward motion, rest, if there be no stoppage to the wheel that moves the pitman? Could the upper point of motion be observed by the aid of the most powerful microscope, and should the wheel barely be moved," he contends, "the slightest turn to the right or left would reveal a proportionate up or down motion of the saw, and that if we did not observe it, it would only be because the magnifying power of the glass did not reveal it."

In answer to this saw argument, we would say, it makes no difference whether the journal or joints have play or not. There are two places in each complete revolution of the crank, or pitman wheel, where the saw stops or comes to rest. Viz., when the absolute center of the crank comes in line with the saw,—when the saw is at the highest and lowest part of the crank's revolution. The saw stops at that exact point where the crank ceases to move up and turns downward,—then again when the crank reaches its lowest point and turns upward. If the professor had a microscope that should magnify ten thousand times as much as the most powerful microscope that probably ever will be invented, he might not even then be able to detect or calculate the time of stoppage. But that would not prove there was no period of rest for the saw.

Now we would ask, can the pendulum or vibrating string possibly start back before it stops? If it can, then we may as easily believe that it is possible to open a door and shut it at the same time, as that is something similar in

principle with revolving bodies, wheels, etc. By watching the wheel when revolving on its axis we see the parts of the wheel from its periphery move through space slower and slower as we approach the center, and when the absolute center is reached there is no motion, though as soon as the center is passed the wheel moves through space faster and faster to the circumference. Thus we conclude that so far as the wheel is concerned its absolute center is at rest having no motion. Just so is it with the pendulum, vibrating string, pitman saw, etc., as well as with two bodies meeting,—all come to a complete stop immediately before they start the other way. Is not this plain and self-evident?

Russell, Kansas.

#### DIAMONDS.

BY THE EDITOR.

The most concentrated matter known to science and the arts is crystallized carbon in the form of the diamond. We say "concentrated," because this in its true sense is what we mean. *Hardness* is the only property of matter which is the true test of material concentration.

It is, however, supposed by nearly everybody that *weight*, in proportion to volume in one body is the real test of the quantity of matter it contains as compared to a given bulk of another body; and, therefore, that weight is the real gauge of material concentration. But, as was urged in an editorial in Vol. I of the MICROCOSM, page 134, weight is no true guide to the quantity of matter a given body may contain, but only indicates the gravitational force it possesses by which a base of pull is furnished for the interaction of the earth's gravity.

In that article we gave what we regarded as unanswerable reasons why a solid ball of glass contains more matter than a ball of gold of the same volume, though having but a fraction of its weight. The reasons there presented we still maintain in their entirety, notwithstanding our position conflicts with the universal teachings of science.

Hardness, on the contrary, has nothing to do with the action of the extraneous force of gravity, but depends solely upon the concentrated form into which its material particles have been placed by the force of cohesion. Thus the diamond, being the hardest of all bodies, and the least compressible of all solids, contains the most matter in proportion to bulk, and necessarily possesses the greatest concentration of cohesive force implied in the very fact of its combined hardness and incompressibility. Hence, also, in this concentrated condition of its material substance in combination with its transparency (another result of the cohesive arrangement of its material particles), consists the superlative brilliancy or fire of this gem. As a confirmation of the fact that brilliancy or gem-fire depends upon the compactness of the material substance in relation to transparency, it is known that all precious stones exhibit this brilliancy of fire in proportion to their hardness in the order of the diamond, sapphire, ruby, etc.

It has been a matter of wonder with many why the diamond, the hardest of all known bodies, and being transparent, the most brilliant, should be the scarcest or least plentiful of all the precious stones distributed through-

out nature. Possibly, however, a reason can be given. As our own greatest efforts in the line of mental and physical activity are the least frequently put forth, so it may well be supposed that cohesion, the regnant force of material nature, puts forth very seldomly its greatest efforts of concentration: otherwise we see no reason why diamonds, rubies, sapphires, and other gems should not be as plentiful as pebbles and boulders.

This very extraordinary character of the efforts of cohesive force to concentrate and purify matter to its utmost limit of perfection as seen in diamonds, also accounts for the well-known limit in their size to only a few carats each, with very rare exceptions, not averaging that of the smallest peas, including all that have ever been found.

The commercial value and importance of the diamond supply of the world, the effect on the market of new discoveries, the possible exhaustion of the sources of supply, the methods of mining, the history of the most remarkable gems of the world, etc., etc., would, if elaborately carried out, form the subject of a volume of interesting research. A few hints only will be given in this paper, and which may not prove uninteresting to the general reader.

In China and India diamonds have been known and valued since before the commencement of the Christian Era; but the process of cutting, shaping, and polishing this most refractory of all substances is of comparatively recent discovery, not dating farther back than some time during the 15th century. Previous to this diamonds were worn as ornaments in their rough or uncut condition, especially when the surface was brilliant and somewhat regular.

The only part of the world for many centuries known to produce diamonds was the district of Golconda in India, and it is a remarkable fact that those mines, notwithstanding the more recent discoveries, have still the honor of producing the purest, largest, and most valuable specimens that now exist. More recently diamonds were discovered in Malacca and Borneo, but nothing to compare in quantity or quality with those of Golconda.

About one hundred and eighty years ago Europe was startled by the announcement of the discovery of a rival to Golconda in the district of Serra du Frio in Brazil, South America; but although vastly larger quantities of the precious stones were produced from the new mines than had ever been found in the East, they produced little effect on the general market owing to their inferior value as compared with the old Eastern gems.

The discovery in Brazil was accidentally made while mining for gold. A tourist from Amsterdam, happening to visit the gold mines, saw the negroes throw away diamonds among the refuse as ordinary quartz pebbles. After securing a good supply he returned to Europe and let out the secret.

More recently diamond mines have been discovered in the Ural Mountains, but no great addition to the general supply was thereby made. It was not until less than two dozen years ago that any decided impression was made on the diamond market of the world by the discovery of the South African diamond mines.

The supply from this prolific region has been such since its first discovery that the ordinary



grade of stones has fallen almost, if not quite, one-half in value throughout the world. In fact, so abundant have the precious stones become, in consequence of these new mines, that almost any man or woman of ordinary means, and whose taste runs in that direction, can now sport a brilliant or two of a carat weight, and at a cost not exceeding eighty or one hundred dollars each. Of course, as the weight increases, the price per carat is duplicated immensely.

Since our boyhood days we have been deeply impressed with this wonderful phase of natural production, so much so that we never saw a fine diamond, flashing its inimitable fire, upon the finger of a lady or gentleman but we were irresistibly riveted and dazzled by its almost enchanting effects. For a score of years we thought of diamonds by day and dreamt of them by night, till at last the gold-fever of Pike's Peak broke out in 1860, and supposing it possible that the new gold mines might be associated with diamonds, we shouldered a little *diamond washer* we had invented and started for the enchanting mountains.

Four or five years of wanderings, however, in the snowy ranges and amidst the mountain gorges and cañons in a fruitless search for the sparkling gems, and we became convinced that they were not to be found in the Rocky Mountain regions, and so we returned to New York somewhat disgusted but considerably wiser.

At that time, or soon thereafter, the excitement of the South African discovery broke out and was at its height, and as a matter of course our diamond fever had a relapse and carried us along with it. We tried to shake it off and turn our thoughts to our more recent scientific pursuits, but it was of no use. Destiny seemed to say, "go to Africa," so we resolved to start.

A hardy and intelligent young friend, who drank into our ideas and to whom we had explained our new "diamond washer," had become equally absorbed in our desperate enterprise for penetrating the sand-plains and jungles of Southern Africa in search of new diamond fields, which he had become convinced from our reasoning must exist in the lower Transvaal region.

We prepared several of our machines, into and with which our necessary baggage was compactly stored for the hazardous venture. Our berths were engaged on a clipper ship soon to sail direct for Capetown and Port Natal, from one of which points, to be determined after we had reached Capetown, we were to disembark for the interior.

Our preparations were all complete, when a few days before the date of sailing our strong young friend, who had scarcely known a sick day in all his life, and who had hastily visited his home in the Western part of this State to say good by to his family, was attacked with pneumonia and in four days was dead.

Paralyzed almost by the shock and disappointment, and knowing of no one else trustworthy and competent who would be willing to go with us, we reluctantly abandoned the venture and made up our mind to settle down to the chances of obtaining a fortune without diamonds in our own native land, where we have ever since been engaged in the struggle for existence and the triumph over nature.

But in the midst of all the vicissitudes through which we have passed during these nearly twenty years, we have never seen

the South African diamond fields alluded to in any newspaper correspondence on the subject, that we have not intuitively and eagerly devoured every word and line of its information and feasted our eyes upon its glittering incidents as a necessary part and parcel of our own legitimate stock of knowledge.

The latest and most reliable news condensed by parties on the ground and embodying the chief facts of interest concerning those wonderful mines is the following:

The diamond mines of South Africa were discovered twenty years ago, but it is only within the last few years that they have been worked with anything like profit to the shareholders. The reason of this is not far to seek. The companies who held claims in the mines were at first more bent on inflating the prices of the shares than in developing their claims. They were managed by incompetent and extravagant men and came to grief. Now the lessons of experience have produced a change and the companies have devoted themselves to solid work, with the result that heavy loads of debt have been removed and the mines are looked upon as one of the soundest investments that have ever been offered to the public.

There are four great mines in Griqualand West, from which diamonds are produced to such an extent as to affect the markets. These are the Kimberley, the De Beers, the Dutoitspan and the Bultfontein mines. In the Orange Free State there is the Jagersfontein mine, whose production is very valuable owing rather to the rare purity of the stones than to the number of carats annually won. Besides these, diamonds are obtained in the beds of some of the rivers, especially the Natal River, and from a few smaller mines which have been opened in the neighborhood of the larger mines.

Last year a great change came over the government of these mines. They entered upon a new stage of their existence. They were at first worked by individual diggers until they had reached such a depth in their claims that it was impossible for them to proceed further without machinery, which required capital. These diggers then consolidated their claims into companies, which provided the necessary capital. A process of absorption of the smaller companies by the larger went on for a considerable time, till finally there was left but one large company in each of the mines, the Kimberley and De Beers. The policy which effected this change was not a haphazard one, but had been carefully sketched out by one or two far-seeing men, who patiently waited until their scheme was fully wrought out.

In this process, and owing to the fact that the main movers acquired such a number of shares in the smaller companies as to enable them to control the direction of these companies, the shares in the individual companies rose to such a figure that immense fortunes were piled up by men who followed the markets and dealt in the shares. Thus the shares of the Central Company Kimberley mine, originally valued at \$500, but which could have been bought a little more than two years ago for \$100, mounted up with a bound to \$1800. As it was known that the leading company in the De Beers mine was operating in these with a view to the consolidation of the two great mines, the shares of the De Beers Company mounted in a similar proportion. This consolidation was finally completed about the beginning of this year, and now it may be said

there is but one great mining company in Griqualand West, which possesses the Kimberley and the De Beers mines, and a large interest in the other two.

The work of the consolidation is not yet complete until they possess the whole control of the output of diamonds, so as to hold a virtual monopoly of the trade.

The value of these mines may be judged from the fact that out of Kimberley mine, from 1871 to 1885, about \$100,000,000 worth of diamonds have been taken, while the gross value of the diamonds excavated from De Beers mine during the same period is not much under \$45,000,000, representing one and one-half tons' weight of precious stones. The Bultfontein mine has yielded about \$25,000,000, and the Dutoitspan about \$30,000,000, while the annual output of diamonds from all the mines is now somewhere about 1,000,000 carats, equal in value to about \$25,000,000.

The system of mining now carried on is so regular that the output for many years to come is calculated almost to a certainty, and the stock of the De Beers Consolidated mines is looked upon as almost equal in security to British consols.

#### PROJECTION AND GRAVITY.

BY THE EDITOR.

Last month we printed an editorial under the above heading, in which we assumed a new position in mechanical science.

We confess we were somewhat elated because of the radical and original ideas we had so luckily sprung upon the scientific world in advance of all other investigators. Indeed, we supposed that our solution of the observed facts in relation to the difference in the time of the falling of two cannon-balls—one dropped vertically and the other projected horizontally—was so new, yet so consistent with all well established natural laws, that it would extort a shout of approval from all scientific and friendly critics who read the MICROCOSM.

But guess our chagrin, not to say mortification, to learn in less than a week after the June number had fairly got into the hands of its readers, that our calculation was all at sea and at the mercy of the worst kind of scientific breakers. In other words, that our position was wrong from beginning to end, and that the greater quantity of air a cannon-ball encounters and has to go through in being fired horizontally over that of the one dropped vertically, has nothing whatever to do with retarding the action of gravity in bringing the projected ball to the ground!

Prof. D. James, of Vossburg, Miss., Prof. Henry C. Cox, of Chicago, Ill., and several other Substantivists who are among our truest friends, have almost simultaneously made the same friendly criticism, and have advised us to back out of our new and untenable position as gracefully and as expeditiously as possible so as "not to damage our hard-earned reputation as a scientific thinker," etc., etc.

Well, we have to say in reply to all these most kindly suggestions and criticisms that after weighing them in all their gravital and projectile force we do not feel that we have to back out at all, or that we have in the least endangered our scientific reputation by the novel position we have taken. But on the contrary we still feel that the new position is entirely defensible and overwhelmingly true, namely, that the sole reason why a cannon-ball fired

horizontally from an elevation will take longer to reach a given level than one dropped vertically from the same height, is the vastly greater quantity of air the projected ball has to overcome and displace before reaching that level. This states the whole question in a nutshell.

Now we do not introduce these unfavorable criticisms here for the purpose of replying to them and showing wherein they are wrong, and wherein our own position is correct, for we have no space nor time for the merits of the controversy in this month's MICROCOSM. We merely restate our position and the serious nature of the criticisms urged against it to arouse among our scientific and mechanical readers attention to the problem under consideration, and to induce a careful re-examination of our articles last month, in order to be prepared for the true inwardness of the discussion next month, when, if we live, both sides of the controversy shall be presented.

#### OUR HEALTH-PAMPHLET A SUCCESS.

A little more than two months has elapsed since the first copy of our health-pamphlet was sent out upon its mission, and we now feel gratified to be able to say that no such triumph in the annals of literary ventures has ever been recorded as we have already placed to the credit of this little messenger of mercy.

On deciding to issue a 32-page pamphlet, as announced in the April MICROCOSM, to embrace and unfold our treatment for Health and Longevity, we had not formed the slightest conception of the enthusiasm with which it was destined everywhere to be welcomed into the homes of the afflicted.

Already that pamphlet is owned and studied, and its instruction followed out in numerous families in every State and Territory of the Union. To show how these purchasers value the health-discoveries thus unfolded, we print another installment of indorsements on the next two pages; and what is remarkable in this exhibit is the fact that the medical profession are among the most enthusiastic admirers of the new treatment as soon as they come to investigate its claims, notwithstanding its hostility to drug-medication. The truth is, this new system of attacking disease and promoting health appeals so forcibly and self-evidently to their educated minds and cultivated experiences that they see the whole thing at a glance as no non-professional is capable of grasping it. We simply add, that we defy any intelligent person to read the next two pages and not become convinced of the great value of the treatment therein discussed.

A few lines now remain for a matter of business: From all parts of the country we have been urged to issue a circular for canvassing purposes, suitable to place in every house of a city or village, in order that all the inhabitants thereof shall at once be informed of this remedy, thereby to save as many lives as possible from suffering.

We have decided to comply with this wish, and will immediately use the plates of the next two pages, precisely as they now stand, for a canvassing circular, and will print them by the hundred thousand copies, to be sent to local agents in any desired quantities, free of cost except postage,—8 cents per 100.

No reference in this circular, as can be seen, is made to our home address, thus enabling each agent who may canvass a town to reap the fruits of his own efforts by directing inquiries for the pamphlet to himself. This he can do by stamping or penning his address on the margin of each circular sent out. Sample lots of these circulars will be sent free.

No person can become an agent who has not first obtained a pamphlet in the regular way, by signing and returning to us a "pledge of honor," after which he can order the pamphlets from us, three or more copies at a time for cash, at the price we have intimated in writing through our book-keeper. By having a few pamphlets and pledges always on hand, an agent need lose no time in filling orders.

Present owners of the pamphlet, who may desire to take advantage of these suggestions, should lose no time in supplying themselves with circulars and pamphlets for this canvass, and thus begin to spread the news among the afflicted.

Remember that any person can send for a "pledge of honor" for examination, preparatory to sending for the pamphlet, without being under the least obligation either to sign or return it.

New readers desiring further information, can have the previous three numbers of the MICROCOSM—April, May and June—free.

**Dr. Wilford Hall's Great Discovery for Health and Longevity, without Medicine.**

This wonderful and revolutionary advance in physiological, therapeutical and pathological science is accomplishing such wonders in the restoration of health, even where persons had been given up by their physician as incurable, that we have no words in which to set forth its real merits. No one can duly appreciate its sudden appearance, astonishing spread and popular achievements without a study of this journal from the April number onward. We can here only hint at the triumphant character of the little Pamphlet which unfolds the system, by filling these pages of the MICROCOSM with a few more out of hundreds of indorsements such as never before were printed or read concerning anything of the kind.

Dr. J. M. Peebles, whose Sanitarium, as the centre of his enormous medical practice, is at Hammonton, N. J., and who admittedly is one of the most learned physicians and surgeons now living, has sent for our pamphlet and has received it as a physiological revelation. He writes:

"Your health pamphlet dropped in upon me like a healing ray of sunshine. I read it with avidity, and at once put your treatment into practice, and it is scarcely necessary to say I found it all you recommend it to be and more. It is not only pathological, physiological and hygienic, but rational. Already have I derived great personal benefit from your discovery. \*\*\*

"Truly yours, J. M. Peebles, M.D."

[Dr. Peebles is a graduate of several medical colleges, has circumnavigated the earth three times in the interests of therapeutical and pathological science, and is the author of eleven volumes on the subject, the last being "How to Live a Century and Grow Old Gracefully."—a work which we have read with profound interest. The indorsement of our pamphlet and treatment by such a distinguished authority, surely needs no comment. We will only add that the magnificent Sanitarium of Dr. Peebles will now be authorized to give its patients the full benefits of our new hygienic discovery, in addition to its other superlative health advantages.]

The Rev. Dr. A. L. Cole, of Santa Ana, Cal., writes:

"My Dear Dr. Hall: I wrote you my favorable impression of your pamphlet on its first reception, and I now write again, after giving the treatment a thorough test, to say that without the shadow of a doubt in my mind it is infinitely superior to anything in the entire history of therapeutical science. I have studied every phase of medical science and philosophy for fifteen years and ought to know something about it. Yet I aver the opinion that the treatment set forth in your Health Pamphlet is the first that has ever touched the true basis of disease, capable of removing its cause without injury to the human constitution. It is more than wonderful: it is simply marvelous. For example: I am now free from pain, after a few applications of your remedy, for the first hour of conscious existence for twelve years. This is literally true, and I am amazed at it. \*\*\*

"Your grateful friend, A. L. Cole."

Robert Craig, Bristol, Tenn., writes:

"Your pamphlet has been read and re-read. It astonishes me that the M.D.'s have been sailing for centuries in that direction, always stopping short of the prize, and finally leaving A. Wilford Hall to be the Christopher Columbus and the rightful discoverer of the America of true pathological and therapeutical science. I regard the \$4 I sent you as the merest bagatelle. My father was an M.D. of extensive practice, and I was surrounded with medical books from my very boyhood, very few doctors having read as much of such literature as I have. But I must confess that I never read a treatise on the causes of disease or its true remedy so rational and convincing as this same pamphlet of 32 pages. \*\*\* I am threatened with Bright's disease of the kidneys, but I now see the rationale how it can be cured. I will report as I progress. Truly your friend, Robert Craig."

John Platt, Topeka, Kansas, writes:

"I have been following your treatment for some time, with the most satisfactory results upon my general health. As proof of this I have changed so much

in one month, that persons not aware of my experience, exclaim on meeting me: 'What's the matter with you?—You are growing younger!' I tell them if they will send for Dr. Hall's pamphlet and follow out its instructions they will grow young also.

"Sincerely your friend, John Platt."

W. P. Pollard, Saratoga, Cal., writes:

"A. Wilford Hall: Dear Doctor.—The two pamphlets to myself and Mr. Foster were duly received. Mr. Foster and his wife have both been using your treatment with astonishing effect, and are both getting well, though his wife was about given up to die. Mr. F. had taken immense quantities of medicine costing him enough to pay for your pamphlet a hundred times over. But this he now says is at an end. He is very grateful that his attention was ever called to your discovery. Truly, W. P. Pollard."

Mrs. Cecilia Horsey, our agent at Portage, O., writes:

"I inclose another order for pamphlet, for Rev. L. Moore, of Bowling Green, Ohio. Please send me another supply of blank pledges. Your treatment is gaining friends and giving good satisfaction. Mrs. Deintez says she has received more benefit from it in the short time since the pamphlet came (about one week), than from all the medicine she has ever taken, and she has been doctoring constantly for a number of years. Her ailment has been trouble of the kidneys. \*"

"Very truly yours, Mrs. Cecilia Horsey."

Rev. C. E. Hiscox, Pastor First Baptist Church, of Greenport, Long Island, writes:

"Your pamphlet on Health and Longevity came duly to hand, and I have read it with intense interest, and am entirely convinced that every word you say in it is true. It commends itself to my judgment as nothing else I have ever read or heard in the direction of health. I have tried it on myself twice and will report as soon as I have given it a thorough test. I am enthusiastic over it, and am commending it strongly to others, from whom you will no doubt hear soon. By the way, could you not reprint from the May and June MICROCOSMS, the Preface and Introduction to your large work in leaflet form convenient to be handed around among friends to read? Fraternally, C. E. Hiscox."

[The numbers of the MICROCOSM themselves are better than leaflets, as they contain other valuable matters. And we will cheerfully send bundles of them free for circulation.—EDITOR.]

A. C. Brown, of Dewey, Ill., writes:

"Dear Dr. Hall.—It is now two weeks since I received your pamphlet during which my wife who was in very poor health has been faithfully putting your instructions into practice. I am glad to report that she was benefited from the very start, and is still improving under your very gentle and common sense treatment. She now sleeps soundly and sweetly. I believe that a door to do much good for suffering humanity has been providentially opened by the printing of your little pamphlet. Look for an order from me soon. \*"

"Very truly yours, A. C. Brown."

G. T. Wilkinson, P. M., Trenton Mills, Va., writes:

"Dear Dr. Hall.—I have had your Health pamphlet for some time and have made three applications of your treatment upon myself which have given me great relief. I am already so confident of its invaluable merits, that I do not hesitate to proclaim its value to all with whom I come in contact. A little time, I am assured, is all that is necessary to make it take the place of drugs in any community. My family physician pleasantly assures me that I am creating a genuine sensation by my enthusiasm over Dr. Hall's Health Pamphlet. I am fully persuaded that the sales of the pamphlet must increase rapidly as soon as a few sick persons in the neighborhood demonstrate its value by getting well, which will not be long. Some who need it badly and who are taking medicine all the time, are waiting in hopes they can get it cheaper after a little. I am surprised that you put it at so low a figure. Some of these persons will take four dollars' worth of medicine while they are waiting to save a dollar on price of the pamphlet. Send me a few blank 'Pledges of Honor,' and I will help to spread the good work. \*"

"In haste, yours, G. T. Wilkinson, P. M."

Rev. H. Z. Adams, D. D., Orange, Cal., writes:

"Inclosed please find \$4 for the Health Pamphlet, for Rev. J. M. Jameson, D. D., of Los Angeles, Cal., and I hope to send you many other orders soon. Let me say in a word, I have read, re-read, and scanned narrowly your Health Pamphlet from a physiological and

\* What hinders intelligent ladies everywhere starting this treatment among their own sex as an employment, and thus save their suffering sisters from the ruinous effects of so much drug medication? Editor.



anatomical standpoint, and I must say I am satisfied it is the best thing I have ever seen or read. You have my thanks for the light it sheds on those intricate subjects. I have been using your treatment for about a week every second night, and I find it a perfect luxury. When I say I am well pleased with your discovery it but faintly expresses my appreciation of its merits. You must, it seems to me, have been guided at the ordeal you describe which took place forty years ago, by some invisible agent for the solution of the important problem now set forth in your pamphlet. Long may you live to enjoy the benediction of the Divine Father, and then go to live with him forever.

"Yours in fraternal bonds, H. Z. Adams."

Rev. W. P. Hall, Point Peninsula, N. Y., writes:

"Dear Doctor.—Please find inclosed \$4 with signed 'Pledge of Honor,' for pamphlet for Rev. H. L. Holmes, of Sackett's Harbor, N. Y. The transformation already made throughout my whole system by your treatment is marvelous. The burning sensation in the region of the kidneys which I have been compelled to endure for so many years all passed away at the fifth application of your treatment, and the weakness of back which it produced is rapidly going with it. Bless the Lord for ever giving you the physiological knowledge for the achievement of this wonderful discovery.

"Yours very truly, W. P. Hall."

Rev. Geo. Cook, of Millican, Texas, who was struck with what the doctors supposed to be a fatal paralytic shock, and whose letter indorsing the new treatment appeared in June MICROCOSM, now sends his seventh order for pamphlets, and writes:

"Dear Friend, Dr. Hall: Inclosed find the money for three more pamphlets with pledges signed. June MICROCOSM is a 'stunner' indeed. Send me one hundred copies of it at once. I can put them where they will do good. My health is now quite restored. Others here who have sent for the pamphlet, are just beginning to try the treatment, and all are pleased with it. I will report further soon and send for a number of pamphlets. Yours truly, George Cook."

Christian Stoner, Polo, Ill., writes:

"Dear Dr. Hall: The pamphlet was duly received, and after giving it a slow and careful reading, I commenced experimenting, being fully satisfied that your reasoning was sound. And now, after just two weeks of trial, I am ready to say that I would not take \$50 and be again ignorant of your discovery."

"Yours truly, Christian Stoner."

L. E. Moberly, Armington, Ill., writes:

"Dr. Hall, Dear Sir: I received the pamphlet unfolding your new system of physiological treatment for the cure of disease and preservation of health without medicine, and at once proceeded to test its merits for my kidney trouble and inflammatory rheumatism. I am happy to report that the result of a few applications only has been most satisfactory. I am so much pleased with the treatment I wish to call the attention of my friends and neighbors, and would like to have a few blank pledges for them to sign. In haste, your friend, L. E. Moberly."

C. N. Bryan, of Marshall Hall, Md., writes:

"I have been in receipt of your pamphlet for about thirty-five days, during which I have frequently tested your treatment with the most surprising and satisfactory results. I can now testify that I am more than fifty per cent. better every way than I was at the start. Then I had no appetite to speak of and food many times was absolutely disgusting. Now my appetite is simply ravenous, and at times almost uncontrollable. I am gaining in flesh and rapidly improving in my general health. I am determined to let my friends and neighbors know of this great discovery, so I have put a notice in our county paper and will also put notices in the Washington City papers, if you will permit. I hardly know how to express my gratitude to you for this marvelous remedy. I tell you, Dr. Hall, drug-medication is doomed. Truly yours, C. N. Bryan."

Rev. John W. Harmon, Anguilla, Miss., writes:

"That your treatment has helped me there can be no doubt. I had yesterday a terrible dizziness, so that I could scarcely stand. I at once bethought me of your treatment and without delay tried it. I am happy to say that the relief was immediate. Under the new system of hygienic regimen I rallied instantaneously; but under the old treatment, I should have gone to bed and suffered from disgusting medicines as I have so often done in former days. I shall do all I can to make known this treatment by introducing your pamphlet for the relief of suffering humanity. John W. Harmon."

Dr. George D. Norris, of New Market, Ala., whose unqualified indorsement appeared last month, writes:

"Inclosed find a money order for another pamphlet

with pledge signed by Francisco Rice, M. D., of this place. Dr. Rice is an old and estimable physician. \* \* \* My daughter who uses your treatment is delighted with it; and I have also to say that I have used it with infinite satisfaction, benefiting me very much.

"Very truly yours, George D. Norris, M. D."

Dr. Jesse Huestis, of Columbus, Ohio, referred to in our Personal Statement, in April MICROCOSM as the second M. D. to whom the new treatment was revealed, writes to a brother physician who had inquired of him concerning the pamphlet:

"You need have no doubt concerning the merits of the new treatment. I consider Dr. Hall's statements as true in every particular. He has in my opinion made the most valuable discovery of this or any other age for the purpose of combating diseased action in the human system, be the type what it may. \* \* \* I consider the price (\$4) merely nominal when compared with the inestimable value of the discovery. It is just as accessible to everybody under his method of selling it, by first requiring a pledge of honor, as would be a doctor's prescription for which he might charge the same price. In both cases the remedy is free to all who are willing to pay for it. \* \* \* It is without doubt the true secret of longevity, and is as valuable to those in health as in sickness, promoting sound sleep, perfect alimentation, freedom from weariness under exertion, and a sure protection of the circulation from impurities. \* \* \* I was studying the problem of pulmonary consumption and kindred diseases, when I had the good fortune to procure the full understanding of Hall's discoveries and methods of treatment. To these I became an immediate convert, and with the utmost delight hailed them as being fully capable of supplying all that I had heretofore lacked in the successful treatment of consumptive cases. \* \* \*

"Jesse Huestis, M. D."

[The whole of the doctor's long, splendid letter is of the same vein. Sorry we have not room for all of it.—Editor.]

Geo. T. Halbert, Esq., Vanceburg, Ky., writes:

"Your pamphlet and treatment are a success. The Vice-President of the Bank of Maysville has just left \$4 with me to have you send him a pamphlet. Judge Thomas has just received his, and pronounces it a good thing. \* \* \* I have been troubled with the piles for several years, but since using your treatment I find myself entirely well and no sign of this miserable complaint. All this, too, without medicine of any kind. I am sure I can procure many orders for your pamphlet if I only had a supply of your pledges of honor. Send me some immediately. Truly, Geo. T. Halbert."

Mr. Samuel Richards, Newton, Iowa, writes:

"Inclosed find check for four more pamphlets for neighbors of mine. My commendation of your treatment, as printed in the June MICROCOSM, does not begin to be strong enough to express my appreciation of its merits. If the money value of health as compared with sickness can be computed at all, then may we talk of the value of your pamphlet in dollars and cents, but not otherwise. Bro. Johnson joins me in saying that it is simply 'priceless.' You can publish this in the MICROCOSM on my authority. Your very grateful friend, Samuel Richards."

Rev. M. A. Smith, pastor M. E. Church South, at McAlester, Ind. Ter., writes:

"Inclosed please find signed pledge of Rev. W. H. Hicks, our Congregational minister, and the money for his pamphlet. \* \* \* I am not a bit surprised to see in the June MICROCOSM the wonderful things your new discovery is accomplishing for those who have tried the treatment. I want to tell you with tears of joy what it has done for my wife. For about a year she has been regarded as a hopeless consumptive. Our physicians had given her up as incurable. She had patiently and resolutely tried all sorts of medicines recommended by different friends, when your pamphlet arrived on the 26th of April. She at once read it with me and we became fully convinced as to the soundness of your reasoning. Without loss of time she proceeded to adopt your remedy, and now what words can I employ to express our happiness over the result? \* \* \* She commenced to improve in strength and flesh immediately, and so marvelous has been the change that she now weighs as much as she ever did! Praise God, and thanks to you Dr. Hall. The dark cloud has been lifted from our sky. Your grateful friend, M. A. Smith."

A sufficient number of similar indorsements to fill twenty pages could easily be printed if necessary; and they are arriving with every mail from all points of the compass.

[Should any one doubt the genuineness of these voluntary testimonials he or she is at full liberty to address any person named on these two pages, always, of course, inclosing stamp for answer.—Editor.]

## THE LIBRARY OF SUBSTANTIALISM.

This library consists of eight volumes, all of which are devoted to the principles of the Substantial Philosophy. These volumes are:

1. The "Problem of Human Life," 324 double column octavo pages bound in cloth, price \$2, by mail. This was our first scientific book, of which between 60,000 and 70,000 copies have been sold without a dollar spent in advertising—simply by one person telling another. The discussions and original principles introduced and unfolded in that volume have led to seven other books, making up this library, as follows:

2. Five volumes of the *Microcosm*, of nearly 400 double-column octavo pages each, bound in cloth, price \$1.50 per volume, or \$7.50 for the set, by mail. These volumes contain the rise, progress and complete elaboration of Substantialism during its stormiest discussions, directly after the circulation of the "Problem" began, and are invaluable to those desiring to obtain a knowledge of that Philosophy in all its details.

3. The *Scientific Arena*, volume I, a large quarto of nearly 800 pages bound in cloth, price \$1 by mail, is a continuance of the discussions, in an advanced form, of the first five volumes of the *Microcosm* named above. The second volume of the *Arena* is not yet printed and bound, but will be after a while, and will then be included in the "Scientific Library," at the addition of \$1. Those desiring it are now sending in their names. As soon as 250 names are received it will go to press.

4. The Text-book on Sound, bound in cloth, price 50 cents, is one of the most important of the entire series of the Eight volumes. It is by the Rev. Dr. J. I. Swander, under our own most careful revision, and no man can read it understandingly without being convinced of the absolute truth of Substantialism.

## Dr. Wilford Hall's Scientific Library.

[From the *Arena*.]

"The principles of the Substantial Philosophy, with their collateral bearings, which are unfolded in Dr. Hall's writings, have cost him more than ten years of unremitting labor, such as few men besides himself have ever performed. The results of this tireless scientific and philosophical research, as therein elaborated and set forth, can be found in no other library of books on earth; and those who fail of the present opportunity to secure these unique works, at the trifling cost proposed by his publishers, will realize a missing link in their chain of knowledge, which they may always regret and may never be able to supply."

## Eight Volumes that Will Live.

"This Library consists of the "Problem of Human Life" (\$2), the five volumes of the *Microcosm*, bound in cloth (\$7.50, or \$1.50 each), the first volume of the *Scientific Arena*, bound in cloth (\$1), and the "Text-Book on Sound" (50c.), amounting in all to \$11.

"By special request of Dr. Hall this entire library will be sent to any person by express on receipt of \$3, if ordered soon, or before the plates shall pass into other hands—an event probably not far distant. If sent by mail the postage, \$1.25, must be added.

"No person who has tasted the fruits of this comforting and elevating system of doctrine, as set forth in those volumes, should allow this opportunity to go by for leaving to his children an heirloom which may prove an almost priceless memento in coming generations. Bear in mind that this library can only be obtained by addressing the Editor of this paper."

## Appleton's Encyclopedia.—A Great Offer.

"We have several sets of "Appleton's Encyclopedia," second hand but in excellent condition (not the illustrated edition, but the one previous), 16 large 800-page volumes, in leather binding \$30; or in cloth \$24. Either set is worth to any student double this amount. Let no man complain after this that he lacks the facilities for obtaining universal knowledge, a thing which is only possible with a good encyclopedia.

Address A. WILFORD HALL,

Editor of the *Microcosm*,

23 Park Row, New York.

## Three Cash Prizes—\$30, \$20 and \$10.

Our contributors, and our literary, scientific and philosophical friends should not forget the opportunity we have presented for earning one of the above-named cash prizes during this volume by sending us an essay on Substantialism or collateral discussions. Remember, these essays must not be more than a single solid page of this paper, in briefer type.—1,200 words. See this announcement as first made in December, or in No. 1, of this volume. A number of writers, as we learn, are preparing themselves by study for this contest.

## What the Press Say.—A Mere Specimen of Hundreds of Unsolicited Notices.

## "A Masterly and Triumphant Refutation."

[From *The Christian News*, Glasgow, Scotland.]

One of the most trenchant and masterly opponents of this theory (Darwinism) is Dr. Wilford Hall, of New York. Some time ago he wrote a book entitled *The Problem of Human Life*, in which he subjects to a searching and critical analysis the strongest arguments in favor of evolution advanced by Darwin, Haeckel, Huxley, and Spencer, the acknowledged ablest exponents and advocates of the system. Never, we venture to say, in the annals of polemics, has there been a more scathing, withering, and masterly refutation, read or printed. Dr. Hall moves like a giant among a race of pigmies, and his crushing exposures of Haeckel, Darwin & Co. are the most sweeping and triumphant we have ever read within the domain of controversy. If our thoughtful and critical readers have not yet read the book, we venture to prophesy that they have a treat before them.

## "The Book of the Age."

[From *The Methodist Protestant*, Baltimore, Md.]

This is the book of the age, and its unknown author need aspire to no greater literary immortality than the production of this work will give him; and thousands of the best-educated minds, that have been appalled by the teachings of modern scientists, will "rise up and call him blessed." Hitherto it has been the boast of atheistic scientists that the opponents of their doctrines have never ventured to deny or to solve the scientific facts upon which their theories are based. But our author, accepting these very facts, unfolds another gospel; and Tyndall, Darwin, Haeckel, *et al*, are mere pigmies in his giant grasp.

## "The Most Startling and Revolutionary Book."

[From *The Brethren at Work*, Mount Morris, Ill.]

It is unquestionably the most startling and revolutionary book published in a century. There is no escape from the massive accumulation of facts and the overpowering application of principles in which the work abounds from lid to lid. It marks an epoch in the centuries. It is a work of Providence, and will not accomplish its mission in a generation. It unfolds truths that will stay as long as Christ is preached. Although strictly scientific, its one aim is the demonstration of a personal God and a hereafter for humanity. We never tire reading it. It is an exhaustless mine of Christian truth. It is the literary *chef d'œuvre* of the age. It is worth its weight in diamonds.

## "Meets the Wants of the Church."

[From *The Dominion Churchman*, Toronto, Canada.]

We most cordially concede to *The Problem of Human Life* the well-earned title—the book of the age. Doubtless the God of Providence has raised up the author to meet the wants of the Church in this time of need.

## "Originality, Thoroughness, and Ability."

[From *The New Covenant*, Chicago, Ill.]

We can truly say we are amazed at the originality, thoroughness, and marvelous ability of the author of this work.

## "The Death-blow of Atheistic Science."

[From *The American Christian Review*, Cincinnati, Ohio.]

The author, a man of acknowledged genius, and confessedly the brightest scientific star of modern times, has startled the religious world into transports of joy and praise. No religio-scientific work has received both from the secular and religious press such willing and unqualified praise as *The Problem of Human Life*. It is the death-blow of atheistic science.

## "The Mightiest Scientific Revolution ever seen."

[From *The Journal and Messenger*, Cincinnati, Ohio.]

*The Problem of Human Life* is a very unexpected contribution to scientific polemics, which, if its reasonings shall be justified, on thorough investigation will prove to be one of the loftiest achievements of this age, and effect one of the mightiest scientific revolutions ever seen.

Canvassers will be supplied free of cost with bundles of the *Microcosm*, on application, to enable them to leave copies with intelligent families. For information both as to the book and the paper, address the Editor, 23 Park Row, New York.

Press of H. B. ELKINS, 13 and 15 Vandewater Street, New York.

# The Microcosm

A MONTHLY JOURNAL OF SUBSTANTIALISM AND COLLATERAL DISCUSSIONS.

THE ORGAN OF THE SUBSTANTIAL PHILOSOPHY.

**A. WILFORD HALL, Ph. D., LL. D., Editor and Proprietor.**

(Author of the "Problem of Human Life," "Universalism Against Itself," Editor of the *Scientific Arena*, &c., &c.)

**ROBERT ROGERS, S. L. A., Associate Editor.**

Address all communications to A. WILFORD HALL, 23 Park Row, New York.

Vol. VI.—No. 9.

AUGUST, 1889.

50 Cents a Year.

Entered as second class matter at the New York Post Office.

**Does Sound, Outside of Our Sensations, Consist of "Condensations and Rarefactions"?**  
—Prof. Stevens finished.

BY THE EDITOR.

Every text book on physical science answers the above question in the affirmative. Though for more than ten years we have been combatting the wave-theory and, of course, taking the negative of this question in opposition to all the colleges of the world, we now declare that we have not negated the current theory of acoustics half as positively or as radically on this question as the facts of science justify, or as we now purpose doing. In other words, we have heretofore conceded to the wave-theory of sound vastly more than was necessary to concede and still keep within the strict bounds of scientific truth.

For example, in the "Problem of Human Life" and in the early volumes of the MICRO-COSM, we have admitted that a vibrating string, or the prong of a tuning-fork, does actually condense the air, as claimed by the authorities on physical science, and that it thus drives off waves of "condensation and rarefaction" for a limited distance around the vibrating instrument, though these air-waves, as we insisted, were only incidental to the sound-pulses, and in no sense identical therewith. We now take this concession back, and assume, as we claim we have a scientific right to do, a more aggressive and destructive attitude toward that theory. We now assert, and will undertake to make that assertion good, that atmospheric waves of condensation and rarefaction, or in other words, air-pulses, do not enter into the phenomena of sound at all, either primarily as sound-pulses themselves, or incidentally as the effects of the action on the air of the vibrating instrument.

We feel sure, however, that such a radical position as here for the first time assumed, will be regarded by Dr. Mott and by other thoughtful Substantialists as altogether too strong to bear the test of scientific scrutiny. We shall soon see whether or not it can be maintained.

We are referred to the fact of the vibrations of tensioned diaphragms, as, for example, those of the telephone and phonograph, in close proximity to the sounding instrument and with such force that even indentations are made in the foil and wax of the phonograph so distinctly that by their mechanical repetition against a similar diaphragm the same vibra-

tions may be reproduced, and the same sounds and even spoken words may be uttered and heard.

Now we admit all these facts, as they are well-known to science. But, says the wave-theorist, if you admit the facts, what is there to produce the vibrations of these diaphragms unless it be the air waves or atmospheric pulses which the sounding-body drives off and thus causes to impinge against these diaphragms in rapid succession, thus forcing them into a corresponding rate of vibration?

This question, of course, states correctly the current theory which prevails in all the schools and as laid down in the books. But we now deny the whole thing as in no way justified by the facts observed, but which on the contrary absolutely contradicts the facts when they shall properly come to be understood. Will the reader try to divest his mind for a few moments of all preconceived notions on the subject while we enter into its critical investigation and analysis?

Suppose the vibrating instrument actually to make no sound at all, but still to produce the same or even greater action on the air while producing an exactly similar class of vibratory motions; would a stretched diaphragm, in however close proximity to such vibrating body, respond into sympathetic action? No, but on the contrary it would remain absolutely quiescent. Why should it not be thrown into vibration by the condensed atmospheric pulses thus sent off from the vibrating but soundless instrument, that is, if any such pulses are really sent off as the wave-theory claims.

A soundless vibrating instrument should produce the same sympathetic action on an adjacent stretched diaphragm as one that sounds never so loudly, especially if the two instruments produce equal action on the air. Yet it is a naked and patent fact that one kind of sounding instrument, with large and powerful vibrations, can scarcely be heard at all, while another with manifold less action on the air is known to generate a sound almost deafening.

One of these instruments, as is well-known, will produce no sympathetic motion in a stretched diaphragm notwithstanding its powerful action on the air, and its supposed "condensations and rarefactions," simply because it produces little or no sound; while the other, notwithstanding its small atmospheric disturbance, sends the stretched diaphragm into sympathetic vibration, simply because, as we maintain, it radiates powerful pulses of sub-



stantial sound-force which have nothing to do with the atmospheric disturbance incidentally made by either instrument. Why this difference, so often observed, yet never before explained by any physicist living or dead? Let us try to analyze the problem and divulge the solution.

Writers on sound seem never to have grasped the idea, or any explanation of the idea, that one vibrating instrument will produce sound that can be heard a mile away, while another sounding body of the same vibrational number and of manifold greater action on the air can not be heard a dozen feet away in a still room! We defy any believer in the wave-theory, or who denies that sound is a substantial force, to give any sort of answer to this well-known fact. Yet this single fact—that the intensity and range of sound have no relation whatever to the amount of atmospheric disturbance produced by the sounding body—stands as an everlasting refutation of the current theory of acoustics.

Let us look at it in a little more detail for a moment. Why, for example, will a tuning-fork of a given pitch, when struck or bowed and held in the fingers, not be heard eight feet away, while a steel tongue or reed of the same vibrational number and of only a small fraction of the prong's area of action on the air or amplitude of swing, can be heard distinctly a quarter of a mile away?

The facts here premised no one can dispute, since a reed in a penny-whistle not any where nearly so large and of no more action on the air than the prong of a tuning-fork, has often been heard a mile of a still night. It is positively certain that so far as air-pulses, or atmospheric condensations and rarefactions are concerned, the prong of the same size as the reed and of the same amplitude of swing and vibrational number, should produce the same effect on the stretched diaphragm at a given distance.

But what are the facts? Why, they are simply these; that the best tuning-fork ever made and caused to vibrate at its best eight feet away from a phonograph or from the most sensitive telephone diaphragm, will make no impression whatever upon it, while the sound of a reed at the same distance and of the same pitch with but a slight fraction of the vibrational amplitude, will make its record upon the phonograph and can be heard miles away over a telephone line. Yet both of these vibrating instruments must have sent the same air-waves or atmospheric pulses against those diaphragms, that is, if they sent air-pulses at all, which we here positively deny.

Then what do they send to cause this sympathetic vibration in these diaphragms? We answer as before, that they send off *sound-pulses*,—not *air-pulses* as the wave-theory teaches,—and that these sound-pulses are constituted of an immaterial, substantial force, analogous to the currents of electricity or the rays of magnetism which, though substantial and objective entities, are neither matter nor motion.

Is any physicist, who pretends to think at all on scientific subjects, so hermetically sealed up in his own theoretic shell that he can not comprehend this reasoning? Prof. Stevens, whose lecture at Columbia College we noticed in the April *MICROCOSM*, publicly declared that he did not possess the intellectual capacity to comprehend the distinction or grasp the idea

of an *immaterial substance*. Let us try to analyze his capacity. He believes, for example, that electricity and magnetism are something, for they certainly are capable of doing work,—lifting and displacing ponderable bodies. Hence they must be a substance of some kind or they could not manifest such physical results. Then, does this professor, who by his own confession is incapable of grasping the idea of immaterial substance, believe that electricity and magnetism are *matter*? If he does,—and he is certainly driven to that dire extremity of self-stultified sciolism,—he involves himself in the absurdity of one material substance or body—magnetism—permeating and completely filling and occupying another material body, steel, in violation of the universally recognized properties of matter.

It thus seems that our professor actually possesses the admirable intellectual capacity of grasping such a stupendous self-contradiction as that two material bodies or substances can occupy the same space at the same time, though his over-worked brain is incapable, as he boasts and reiterates, of conceiving such a simple and self-evident idea as that magnetism or electricity might be an immaterial substance, thus accounting for its occupying matter in every part, and thereby relieving him of all his scientific inconsistency.

After this digression we repeat, that sound-pulses, so far from being mere pulses or waves of material atmosphere, are pulses or radiations of immaterial but substantial force, liberated by the vibrating body from the universal force-element or force-fountain of nature, from whose unfailing supply all other forms of physical force, such as heat, light, gravity, cohesion, etc., are eliminated by the various means appointed in nature to these ends.

These substantial sound-pulses, somewhat similar to electric pulses, traveling through air by a law of conduction determined by the force of cohesion which alone constitutes the air a material body, strike the cohesive force of the tensioned diaphragm and thus act upon it somewhat as substantial magnetic force from the steel magnet coalesces with the cohesive force in the bit of iron and thereby mechanically lifts it even in opposition to the substantial force of gravity.

Thus, and thus alone, is the diaphragm of a phonograph or telephone made to vibrate in synchronism with the sound-pulses which strike it as they are radiated from the sounding instrument in synchronism with its vibratory motion.

The more intense the sound and the nearer in unison with the vibrational number of the stretched diaphragm the greater will be the mechanical tremor in that diaphragm by sympathy.

Wave-theorists on the contrary,—supposing external sound and air-waves to be the same thing,—tell us that the greater the atmospheric disturbance produced by the sounding body, and the more powerful the air-waves thus driven against the diaphragm, the more energetically will it vibrate. This, however, we have just demonstrated to be a base slander upon the physical laws and a bald lie uttered against the truth of science; because the powerfully vibrating tuning-fork, producing large atmospheric disturbance though but little sound (owing to the nature of the instrument), does not in the slightest degree stir the dia-

phragm with its supposed air-waves, while the delicate reed, with a small fraction of such atmospheric disturbance, but with louder sound, causes the diaphragm sensibly to vibrate.

From this we reach the demonstrable conclusion that air-waves, superficially and almost ridiculously supposed to be driven away from the sounding body by its slow and trifling movements, play no part whatever in the sympathetic vibrations of distant diaphragms, but on the contrary that these effects are alone the work of the substantial sound-pulses radiated by a law of conduction from the vibrating instrument,—a startling state of facts, which during all the past centuries of historic science have been mistaken for simple mechanical air-waves.

Instead of stretched diaphragms, let us now take the beautiful experiment of sensitive dancing and singing flames produced by fine jets of gas under given pressure. These experiments are everlastingly harped upon by wave-theorists in their illustrated lectures and exhibitions, in which they try to make their audiences believe that they have shown positive proof of the correctness of the wave theory. Yet we aver here that no stronger proof against the current theory can be asked for than is furnished by these same singing and dancing flames.

Prof. Stevens, in the lecture referred to, so tensioned his gas pressure as to make the flame sensitive to the slightest sharp noise such as a hiss, a whistle, a knock against the furniture or wall, or the clinking of a bunch of keys held in his hand. Of course the professor demonstrated that the flame thus tensioned would duck at each sharp hiss, whistle, or clink of his keys, all of which the substantial theory of sound beautifully explains, while the wave-theory, as we will show, is perfectly dumb and blind upon the subject.

The professor, for instance, went clear into the back part of the hall, fifty or more feet away from his tensioned flame, and at each shake of the bunch of keys, with a sharp metallic rattle, the flame would be caused to duck; and that unreasoning sciolist took it for granted and so made his audience believe that it was the air-waves sent off from the tiny contacts of those keys with each other which went fifty feet away and so smothered that flame that it would momentarily go out! Pshaw! Yet such nonsensical and purile stuff as this took the audience by storm.

Suppose, for example, the professor had covered each key with a thin coat of soft rubber so that no sound or noise would have occurred by their contacts, and suppose he had then shaken them with a hundred-fold the force he did, would the flame have responded to the supposed air-waves thus produced? Not a bit of it, though the real atmospheric disturbances or so-called air-pulses thus generated and sent off might have produced a thousand-fold greater commotion.

Had we been permitted just then to enlighten that audience, we would have suggested that the professor, instead of clinking his keys, set half a dozen assistants each to bowing and sounding tuning-forks in that far-off corner of the hall with a thousand times more real condensation and rarefaction of the air, if there be any truth in the wave-theory (yet producing no sound that could reach the flame), and thus demonstrate that air-waves have nothing to do with the phenomenon. This having been

done, we then could have explained, according to Substantialism, in a few sentences, the real cause of the mysterious dancing of the flame in response to sound, namely, that the pulses of Substantial sound-force from the bunch of keys on reaching the flame, in which the cohesive force of the gas was actively being transformed by heat-force into light-force, this cohesion is so influenced by the sound as momentarily to give it control of the combustion and thus to quench the light. How simple and how plain! The whole phenomenon depends for its effects upon the correlation and interaction of the substantial physical forces of cohesion, heat, light and sound, and their inter-convertibility.

Thus, at each sharp clink of the keys the substantial sound-pulse coming to the aid of cohesion, is seen momentarily to shut off the light. The light-force in this case, is but a converted form of the substantial force of cohesion in the gas under the action of heat-force, thereby constituting what we recognize as flame in combustion. *Luminous flame, properly defined, is thus simply the cohesive force of combustible matter in the process of conversion into light-force under the action of heat-force.* But where the flame is non-luminous, or all heat, as in the case of the Bunsen burner, the cohesive force of carbon mixes with the cohesive force of oxygen thus making the cohesion of both an easier prey to heat-force, or in the parlance of chemistry, causes more complete combustion. In what publication, we ask, has the phenomena of combustion and flame ever before been philosophically explained? If the true explanation has ever been hinted at, we have failed to see it.

As proof that this is the true solution of the dancing of sensitive flames under the action of sound-pulses, a close inspection of the consuming jet of gas will show that the non-luminous flame remains intact when the light-flame momentarily subsides, thus proving that the combustion of the gas goes on the same in both cases, though in one case under the correlation of sound-force and cohesive force the combustion is converted into the non-luminous heat-flame, while in the absence of sound it assumes more the character of the light-flame.

But all this reasoning is wasted and worse than Esquimaux on a scientific rut-thinker so circumscribed in his superficiality, as to look upon the forces of nature as modes of motion of material particles instead of real objective entities, and who confesses his lack of sufficient brains to grasp such an elementary conception as that of an immaterial substance. Nevertheless we place this solution upon record in the interests of true science, and for the benefit of rising Substantialists who will know how to make good use of it in stirring up the fossils of the Stevens' type should any remain in the palæontologic strata of acoustical science in the coming ages.

But now we come to the most important part of our discussion. We have assumed that no "condensations and rarefactions" of the air, either as sound-waves or incidental effects, can occur in the vibratory motions of a sounding instrument; and that it is an entire mistake of physicists in supposing that the movement of the prong or string *very slowly* through the air as we have frequently shown, and through but a small fraction of an inch, does any thing more than merely displace the adjacent atmosphere without condensing it at all.

We know that it is asserted as a supposed self-evident fact, that no motion of a body however slow, through a fluid so easily compressed as is our air, could possibly occur without producing a condensation, at least to some slight extent. But this is all assumption without a particle of proof, while on the contrary we have an abundance of reasons for believing that the assumption is false.

Here is another new law of physical science: *It is the normal condition of every fluid substance, on the very principle of its mobility, to be more easily displaced than compressed; and that compression can only take place when this limit is abnormally exceeded by the velocity of the displacing body.* The law thus stated is as infallible as nature herself. Every fluid requires some calculable force to compress it to the smallest degree, even in close confinement. Plainly the force thus applied to the slightest compression of confined air, would, if applied against air unconfined, merely displace it.

We prove this conclusively by the displacement of fluids less easily compressed than air, such as water, mercury, etc. No one for a moment supposes that the slow movement of a tadpole's tail compresses the water in which it swims, even to the slightest degree. Why? Simply because according to our new law its mobility allows it to be displaced more easily than compressed. Of course no one doubts but that a body might be applied to the free water with sufficient force to compress it, containing as it does a slight percentage of vapor; but this is only an abnormal result which occurs when the union-limit of its mobility, compressibility and displacibility is exceeded by the velocity of the displacing body.

This being true and self-evident of water, it is also true of quicksilver, with a still higher limit of possible compressibility because permeated with a still less per cent. of gas or vapor, while it is equally true of every fluid body, however easily compressed, down to that of hydrogen gas.

Air being perfectly free to move aside from the contact of a disturbing body, its displacibility is absolute zero owing to its absolute mobility; while its limit of compressibility will not be touched until an abnormal velocity of the moving body shall exceed the limit of its normal and superior mobility. This latter phase of our law is fully elaborated in the *MICROCOSM*, Vol. IV., p. 313.

Now we revert for a single moment to the confirmatory fact, so often demonstrated in the *MICROCOSM*, that the moving velocity of a sounding body when vibrating, such as a stretched string or the prong of a tuning-fork, even at its greatest amplitude of swing, is an exceedingly slow motion;—never, at its swiftest velocity, exceeding two or three feet a second, and even while sounding distinctly often not reaching a velocity of one inch in an hour!

Prof. Tyndall and other standard authorities on sound have taught the world that the vibrating instrument condenses the air and sends it off in pulses which impinge upon the stretched membrane of the ear and thus throw it into corresponding vibrations, thereby causing the sensations of tone, all of which is the shereest possible scientific nonsense. These writers in their text-books call the student's attention to the fact of tuning-fork's prongs "swiftly advancing," "carving and moulding the air into condensations and rarefactions," etc. But guess the consternation and gnashing of teeth

among these authors and their admirers when, about ten years ago, the "Problem of Human Life" as the first intimation to the contrary the scientific world had ever seen, hurled its thunderbolt revelation among the colleges that this "swiftly advancing" prong never, at its swiftest speed, moves at a velocity of more than three feet in a second, and even sounds distinctly when moving at a velocity of but an inch in an hour!

Of course our ten thousand physical professors were disgusted when they heard of the new book which announced such a prodigious absurdity, so contrary to all established science; and they quieted their anxious students who had heard of the work, by assuring them that the whole thing was preposterous nonsense, a mere jugglery of words, and the hallucination of a conceited sciolist and crank. Tyndall wrote, that it was a "funny book;" Mayer, more candid than the other authors, wrote, on receiving the book, that he had read far enough to find out that he had "something yet to learn." But the disgust and raving of the masses of the professors against the new departure at its first appearance were soon thereafter caused to subside into sullen stillness, which has ever since continued, when Capt. Carter, at our suggestion, mathematically demonstrated in the *MICROCOSM*, Vol. III, page 154, that the prong of a tuning-fork, instead of "swiftly advancing" in order to condense the air and produce sound, as had always been supposed, *would actually produce audible tone when moving at a velocity of only one inch in two years, or twenty-five thousand times slower than the hour hand of a family clock!*

In conclusion we now ask, is there any man, especially a trained investigator of physical phenomena, so deplorably blinded to reason as still to be capable of believing that the free air acted on by a body moving at the velocity just named, would be compressed into "condensations and rarefactions" rather than be displaced? The truth or falsity of the entire wave-theory depends upon the answer to this question. And upon this same proposition does the Substantial Philosophy challenge the science of the world.

#### PRIZE ESSAY No. 14.

#### A Substantial Government.

BY REV. D. OGLESBY.

There is nothing needed in our world more than a form of government that is *substantial*, and at the same time secures the greatest possible amount of happiness to its subjects.

A partial investigation will convince an unprejudiced mind that most of the unhappiness in the world comes from artificial and not natural causes. Nature provides bountifully,—ample supplies to gratify all the necessities of both man and the lower order of animals.

But these bountiful supplies of nature are seized and appropriated by some, while others are left to suffer for them.

In the earlier ages when barbarism predominated, the strong robbed and subjugated the weak, by physical force. Brigandage, piracy, and wars of conquest were the means and methods used. In our day, and the preceding years leading up from barbarism, pirates and brigands accomplish the same ends by obtaining control of governments. The brigand has his headquarters in legislative halls, and the pirate fees a lawyer and goes into business.



Of course the masses must be kept in ignorance and deceived. And nothing gives deception and error such power over men as to be clothed in the garb of law. Few people comparatively look for any higher motive to control their acts than law,—human law. Hence the necessity for a government whose laws stand on the *substantial* foundation of truth.

The basic error of all the governments of the civilized world is, they have adopted and are using a false system of money. This system of money is the tap-root of all the great evils in society. It necessarily and unavoidably produces inequality in society. It creates millionaires on one hand, and fills the world with tramps, paupers, beggars and thieves on the other. It digs the gulf between Dives and Lazarus in this world. If a bountiful Providence causes the earth to produce enough for all, then why should any except the idle and incapacitated suffer want?

It is because of unjust distribution, and this comes from a false money. The philosophy of the method is this: Money, the money of the entire world is considered, or conceded, to be property. Not only that, but it is placed superior to all other forms or kinds of property. Not only that, but it is vested with vitality, and placed on an equality with man, "the noblest work of God." Not only that, but it is placed above, and superior to man, so that *the man* is measured by, and stands in society *politically*, according to the money he can command.

Money, in consequence of this property character given to it, is politically "the God of this world." The sacrifices the world offers to this divinity in usury in its ten thousand forms, fill the world with poverty, degradation, vice, crime and misery, to an extent known only to the Ruler of the world.

"The destruction of the poor is their poverty." Poverty is the source of nearly all the crime in our world, and the poverty of the masses is secured by and through this false system of money.

This fact I will now proceed to demonstrate:

Money is not property. It only represents the price value of property. As civilization is sustained and lives by exchanging the products of labor, money was invented and is used as a medium of exchange;—otherwise the civilization of the world would have been impossible; only barbarism, or swapping articles of production in the markets, would have been possible. Labor creates all wealth. Money is only designed to represent and express the relative amount of labor invested in the production of articles for sale or exchange.

For illustration, Jones is a shoe maker, and Smith is a tailor. Jones says to Smith, "I want to swap a pair of boots for a coat, Mr. Smith." Smith says, "Mr. Jones, it takes me twice as long to make a coat as it does for you to make a pair of boots, and hence a coat is worth two pairs of boots." Now if \$2.00 represent the worth in labor of the boots, \$4.00 will represent or express the price of the coat in labor. It is seen by this little illustration that money is not intended to fix prices, but to express prices already fixed by labor. This is a recognized principle in production, but when we come to exchanges, it is ignored. The commerce of the world is not on the basis of labor, but it is buy for one, and sell for two. In making exchanges of the products of labor, money—a *property* money—steps in, and robs

the laborer. We will further see the absurdity and wickedness of this property money, by an illustration or two.

A bolt of cloth has a definite length. The yard-stick is used, not to fix the length by making it longer or shorter, but to ascertain and express the length. A section of land has an area of 640 acres. The surveyor uses a chain 33 feet long, with 100 links in it, not to fix the area but to ascertain the boundary lines and find the corners. If the yard-stick or the chain, was made of rubber, then the length of the bolt, or the area of the section would depend on the way the measuring instruments were manipulated. Just so with our property money. It is like a chain made of india-rubber. It expands and contracts at the will of money-mongers, carrying prices of labor and property with it, up and down.

The length nor number of yard-sticks or chains, can have nothing to do with the length of the bolt of cloth, or area of the section of land. Neither does it matter at all what kind of material they are made of. So of money.

The size of the dollar, or the material out of which it is made, or the number of them, can not *justly* have anything at all to do in fixing the price of labor and its products. A dollar made of wood, leather, or paper, would be as valuable to express prices, as one made of gold. The material out of which money is made, has, can have, nothing to do with the function or office, or work that money was invented to perform. But our property money does fix the price of labor and all its products. It is absurd. It is unjust. It is wicked. It is robbery. It is the method by which the labor of the world is enslaved. This is why the idle classes grow rich, and the toilers "hang on the ragged edge of starvation." This is why the idlers live in mansions, and the toilers and wealth-producers live in huts, hovels, cellars, and garrets. This system of modern brigandage builds great cities, and fills them with thieves and robbers. This system of refined piracy creates a demand for soup-houses, poor-houses, jails, and penitentiaries. And no government can lift its subjects to a higher, better, or happier state, that has this erroneous system of money like a mill-stone fastened about its neck. As the people become more enlightened and better educated, they become more and more restless. And if they are driven to believe that government can not be changed so as to secure by law justice to all, then they are driven into anarchy, believing that all governments are necessarily great instruments of oppression.

Hence there can not be a permanent, *substantial* government in the world, until there is devised a just system of money. We might as well expect a man to be in good health, and live to old age, with bad blood. This false system of money has overthrown and destroyed the greatest empires, and the mightiest governments that ever existed on the earth. There can be and must and will be devised a correct and a just system of finance. The space allowed does not permit us here to indicate the correct system which is or could be easily done. Suffice it to say, it must be a system of money unfettered by interest or usury.

Richview, Ill.

[If friend Oglesby will indicate in another Prize Essay how money can represent property, as a means of exchange and not be property or its exact equivalent, he will greatly oblige the editor and the readers of the *MICROCOSM*.]

**Fallacies in Science, A Lecture Before the  
Chicago Institute of Education.**

*An Extract.*

BY HENRY C. COX, A. M.

When the report went out that base-ball pitchers were throwing curve balls, the usual number of scientists came forward to prove that the thing could not be done. In refutation of the claim, they cited the laws of projectiles, and recited the familiar illustration of a body dropped and one thrown horizontally at the same time. It was urged that one might as well talk of shooting a rifle ball round a hill.

Now in the face of these learned treatises in refutation, experts in the game do throw right and left curve, "drop" and "upshoot" balls. A ball is thrown toward a point four or five feet to the right of the striker, moves in an almost right line beyond the halfway point, and then curves to the left and passes the home plate at the proper height for a stroke. A second is aimed as much to the left of the home base, but in due time it curves to the right and into place. A third starts off as though it would go high over the striker's head, but it suddenly curves downward and passes the bat at the regulation height. A fourth, still, is thrown as if to strike the ground before reaching the home plate, but an upward curve brings it whistling by the striker, and "ball" is called.

Now, if it is true as a law, that a body let fall and one projected horizontally descend toward the earth at the same rate, it is true only in a vacuum, when the projected ball has no rotation, or when the rotation is about an axis in the line of its direction.

If the ball rotate to the right about a vertical axis, it will curve to the left; if it rotate to the left about a vertical axis, it will curve to the right; if it rotate about a horizontal, transverse axis, the top moving forward, as a wagon-wheel, it will be retarded in its fall; and if it rotate about the same axis as a spinning-wheel, the top moving backward, its fall will be accelerated.

Now for the "why."—Grasping the outer side of the ball, the pitcher throws his energy into an effort seemingly to hurl it to the right of the striker; but this holding of the right side of the ball, sets it to whirling about a vertical axis to the right. By this rotation the cushion of compressed air in front is driven to the right, and, as in Barker's mill, its reaction sends the ball to the left. As it takes an instant for this reaction to overcome the inertia of the projectile, its course for more than half its course is in an almost straight line,—the curving occurring near the home plate.

Now, holding the inner or left side of the ball firmly so as to retard its motion, it is sent toward a point to the left of the striker; but the whirling movement driving the compressed air to the left, sends the ball to the right.

For the "drop" ball, the pitcher holds it so as to make it rotate upon a horizontal transverse axis, the top moving backward, as in the spinning-wheel. This rotation deflects the compressed air upward and thus sends the projectile downward more rapidly than the force of gravitation alone, would draw it.

The "upshoot" ball, the most difficult to throw, as it requires a more rapid rotation than any one of the others, is secured by holding the lower part back, thus causing it to whirl as

the wheel of a wagon, the top moving forward. The column of compressed air is, by this rapid rotation, driven downward with such velocity, as, by its reaction, to overcome the force of gravitation for an instant and send the ball upward.

Now the conduct of these balls brings a suggestion to mind in the matter of other projectiles. In the throwing of bombs from mortars and the hurling of solid shot from smooth-bore guns, whatever shall cause the projectile to rotate about an axis other than the one which is in the line of the ball's direction, will divert it from the mark. A seam of rust or dirt along the right side of the barrel will cause the ball to strike at the left of the mark, one on the left will send the missile to the right of the spot aimed at, while a seam along the top will make the gun undershoot, and one along the bottom to overshoot, the mark.

**A BIRTHDAY POEM.**

TO A. WILFORD HALL.

[Though somewhat of a tax on our native modesty, we submit the following original and well-written poem, by Miss Sallie Carson, a rising poet of no mean ability, as this specimen clearly shows. Our associate editor is so much pleased with the offering that he thinks it by no means inappropriate in juxtaposition with our 70th birthday celebration, and we confess that under the circumstances we are inclined to let him have his own way.—EDITOR.]

Three score and ten! Yet brave and strong:  
With all the fiery zeal of youth,  
To battle with the false and wrong,  
To wage a war for right and truth;  
And with the well-directed blow,  
To lay the giant Error low.

Three score and ten! As back we gaze  
O'er all that long, eventful life,  
We question what in boyhood days  
First called thee to the field of strife;  
What mystic voice thy spirit heard,  
That all thy powers to action stirred.

Could'st thou, through light and shade, afar  
Discern the ever-nearing goal,  
The prize, that shining like a star,  
Rose on the vision of the soul,  
And bade it scorn, in early years,  
Earth's lower hopes and meaner fears?

No paltry pleasure e'er had power  
To tempt thy feet awhile to stray:  
No greed of gold a single hour  
Could lure thee from the chosen way:  
Nor yet the seven-fold bowl of wrath,  
Poured out could turn thee from the path.

Three score and ten, nor time to rest;  
With greater triumphs to be gained,  
The while a highest and a best  
Still looms above the yet attained:  
And onward, upward, soul and mind  
Must press, forgetting things behind.

All bitter strife shall surely cease,  
Where, on the holy heights is given,  
For warfare just, to conquer peace,  
A sword that hath been "bathed in Heaven."  
Ere long the better day may come,  
And Error's hosts be stricken dumb.

And now a birthday wish for thee:—  
As, one by one, thy years are told,  
May we who love to watch thee, see  
One greatly gifted growing old  
So grandly, gracefully, that age  
Shall clearly write life's richest page.

And may the solemn sunset scene,  
With sacred splendors sweetly shining  
Till through the veil that hangs between  
The earth-life and the life divine,  
The lingering watchers dimly see  
Heaven's morning sunlight break on thee!

S. C.

Beaver Falls, Pa.

**Dr. Swander's "Substantial Philosophy."  
The Last Call for Purchasers.**

Some months ago I announced in the *MICROCOSM* (Jan. No., page 26) that Dr. Swander had generously offered seventy-five cents on each copy of his large work,—"The Substantial Philosophy,"—which may be ordered before Aug. 18th, present month, as a fund for the purchase of a suitable memento for Dr. Hall's seventieth birthday, which occurs on the date above named.

Already, as I learn from Dr. Swander, a modest sum has accumulated from these sales, but not sufficient to do proper honor to the occasion.

I proposed in my original announcement that the fund thus accruing should be used in the purchase of a *gold watch* as a suitable memento to be presented to the veteran founder of Substantialism, and that the name of each purchaser of the book should appear in No. 1, Vol. VII. of the *MICROCOSM*, because Dr. Swander's offer extends throughout Vol. VI. Still, I am anxious that all who intend to order the work should do so at once, or by the 18th inst., thus counting themselves in as aiders and abettors of this memorial souvenir.

I am now, during my college vacation, aiding Dr. Hall in meeting the enormous demand for his health-pamphlet, and will personally see to the purchase of the watch for the occasion. Those who do not own that volume will not regret the \$1.50 required to procure it, particularly as in so doing they will be securing a neat little personal interest in the future timepiece of the editor of the *MICROCOSM*.

Address at once Rev. J. I. Swander, D. D., Fremont, Ohio, inclosing the \$1.50, when the book will be returned post paid.

Respectfully, Robert Rogers,  
Associate Editor.

**THE PRESENT OUTLOOK.**

BY REV. J. I. SWANDER, D. D.

Where are we now? What is the present status of the distinctive philosophy which we have embraced and advocated, and whose threads have interwoven themselves with the sacred fibers of our faith and the syllogisms of our reasonings? Such questions contain no concessions of any fundamental defectiveness in the philosophy under inquiry, and may be asked without indicating any weakening of confidence on the part of the thousands who have thrown aside the exploded theories of men to search more assiduously after the principles and truths that underlie and support all the mere phenomena in the Universe of God.

This much only is conceded, viz.: that it doth not yet fully appear what Substantialism shall be. Time is an element in God's ordained order of things, and a factor in the productive forces at work in the process of all proper evolution. This fact is sometimes ignored by those who may find themselves quite fairly represented in the old lady that sought to accelerate the process of incubation by kindling a small fire under the nest of the sitting hen. The contents came out of the shells, but not as chickens. The factor of time had been ignored as something no less indispensable than the substantial life-germs in the eggs, and continued warmth as a constituent part of the environments.

So with any system involving a principle with a possibility of its development. God himself will not, and, therefore, can not dispense with the factor of time in the unfolding of his time-embracing purposes. Even the founding and unfolding of Christianity in the world furnish no exception to this rule. Time was required in the preparation for its advent, and can not be dispensed with in the proper unfolding of its powers and completion of its mission upon the earth.

In the light of such facts and reasonings, the Substantial Philosophy is to be viewed in any fair and adequate attempt on the part of either its friends or enemies, to judge of its merits as a revolutionary system, claimed by its founder and advocates to be in more exact accord with the principles of being, and of more fundamental importance in solving the problem of human well-being, than any discovery of radical truth announced to the world since the day of Pentecost and the founding of God's kingdom among men.

Have these claims been justified so far as time has served to reveal their character? It is now nearly a dozen years since Substantialism was first announced and publicly proclaimed by its founder. During that time, whether fundamentally false or true, it has incited more earnest inquiry and thorough investigation among unprejudiced physicists and religionists than all the colleges, universities and scientific literature in America. It has waged both aggressive and defensive warfare, and at this point, while there seems to be an ominous lull in the clamor and clash of opposing forces, the question may properly be asked: Where are we now?

The question is not whether the leading advocates of this philosophy have made any mistakes in their inductions and deductions; whether the system has been so fairly and fully stated in exactly correct formulations as to be now known and read in the light of absolute harmony between all its parts, and with entire satisfaction by its many thousands of sincere disciples. No. There is another order of inquiry more in keeping with what the case demands and justifies. Has Substantialism given reasonable evidence that it is sound and correct in its basic principle? If so, its founder and friends may arise, report progress and continue their triumphal march toward the rising sun of a glorious scientific future.

What is that basic principle concerning whose soundness it is now in the line of privilege to inquire? The question is easily asked, and in the light of what has been discovered and demonstrated is now quite easily answered. The fundamental principle, or what was until recently the undiscovered fact that underlies our philosophy, is the essential existence in the constitution of nature of immaterial entities distinct from matter: and that these entities are so many forms of divinely created force, either static or manifestly operative in the outer, material or phenomenal side of things, which in their ascending series constitute one grand and complete scale of being, from a clod of clay under gravital attraction up to the most majestic human form animated and actuated by the energies of a deathless human spirit.

This is the corner-stone that underlies our philosophy, and by which the whole building is being fitly framed together; and, now, after twelve years of crucial test in the light of God's



Word and works, it comes forth from the ordeal without so much as the smell of fire upon its garments.

Of this basic principle two assertions may here be repeated. 1. Its announcement to the world had not been made previous to the appearance of "*The Problem of Human Life*." 2. It has not yet been proven unsound in anything essential to its constitution. This last point is claimed deliberately and without bluster, and in full confidence that no one will dare to step forward and deny the truth of the statement. To concede its correctness, by silence or otherwise, is to concede substantially all that is claimed for the Substantial Philosophy.

Here, then, is where we are at present. No backward step has been taken. Wealth of principle has fought its way notwithstanding great poverty in necessary means and appliances. Dr. Hall has been nobly supported by an increasing army of faithful friends and followers, but himself had always to toe the scratch when a new enemy with a new form of argument entered the scientific arena to assault the precious foundation of our substantial edifice. And whenever any of his disciples wanted wine to sustain and steady their weak and wavering faith he was obliged to furnish the claret of logical deductions by treading the wine-press alone.

Under his continued mastery of the situation and heroic leadership, Substantialism has not only held the fort against all assaults from richly endowed and fully equipped scholasticism, but the war has actually been carried into the country of the Congo and among the inhabitants of a dark materialistic continent. The things that remain have been strengthened by new elucidations in the sun-light of everlasting truth and new converts to the cause which the truth sustains.

Besides this, Substantialism has fortified its position by the production of a literature peculiarly its own. Stimulated by the inspiration of the new philosophy, even its disciples have already written some excellent books and treatises in the formulation of its truths and the advocacy of its claims. These are second in value and interest only to what has been written by Dr. Hall himself. His library of eight volumes will live after the silly theories of materialism and motionism shall have perished from the earth. It should be purchased and read by all Substantialists, as well as by those who are wavering in their fear that the ground upon which they have built is sinking sand.

Furthermore, by so doing, there will be a consequent increase in the number of those who are waiting to celebrate, with appropriate token of their esteem, the turning of the 70th anniversary of the man for whom so many earnest prayers are now going up that he may, by reason of well conserved strength, not only attain to four score years, but also live on until the length and achievements of his life shall combine to crown him the distinguished centenarian of the century to come.

Freemont, Ohio.

As this 70th Birthday number of the MICROCOSM is to be sent free to many thousands who are not subscribers, we request all who receive it, and who approve of its style and contents, to send us the names of distant friends that we may mail them sample copies free. This we will cheerfully do. EDITOR.

**The Art and Philosophy of Great Longevity,  
or How to Attain Vigorous and Youthful  
Old Age.\***

CHAPTER I.

THE ADVANTAGES AND DISADVANTAGES OF  
DRUG-MEDICATION.

BY THE EDITOR.

Several persons, to whom we have read the Preface and Introduction of this work, have taken exception to our disparaging estimate of drugs in the cure of disease and in the counteraction of disordered conditions in the human organism.

We presume we have been misunderstood in this particular, since we never intended to convey the idea that drugs are without meritorious efficacy for the cure of disease or even the preservation of human life. On the contrary we know better, and are certain that hundreds and thousands of diseases have been cured and eradicated from the system by the use of medicines of different kinds, and that pain and sickness have been removed in myriad instances by the application of drugs both internally, externally and hypodermically.

But this is not the question at all, as relates to the merits of drug-medication compared with our proposed treatment which claims to cure disease and prevent its recurrence without medicines of any kind.

What we do purpose teaching and maintaining in the teeth of all therapeutical science, is that drugs at best are but a temporary expedient in abnormal emergencies,—a choice of evils,—and that although they will in many instances cure a given form of disease, they invariably leave the whole constitution very nearly enough worse to balance the good effected, in consequence of the unequal drain upon the vital forces in order to divert or disperse the diseased condition, thereby supplying its place by unduly and injuriously taxing other functions and portions of the organism. This is our exact position.

We venture the assertion that not one form of organic disorder, known to pathological science, is ever cured by the absorption of drugs into the system, that the whole physical and vital economy is not left in a vastly deteriorated condition thereby, compared to what it would have been could the disease have been removed by purely natural action without the aid of medicine; and that the average longevity in all such cases is proportionally reduced in consequence of such drug-medication, whatever temporary benefit or relief may thereby have been conferred.

But in the present condition of science, and oftentimes in the suffering contingencies of the patients, the end no doubt justifies the means, because nothing better is within reach. Better by far shorten life than lose it. Better permanently lose a portion of your health than lose it all by allowing the diseased condition to prevail and finally to triumph.

How much better, though, would it have been could the patient have known in advance how to cure the disease and restore himself to health, by the application of a remedy in every way harmonious with nature's laws and the

\* From a work of this title by the Editor, which was to have been published but which was abandoned, at least for the present, for reasons given in the April number of the present volume of the Microcosm, a condensed pamphlet having been printed instead. See notice of the pamphlet at the close.

dictates of reason, and by which the very cause of the diseased condition could have been attacked and got rid of, and that, too, without drugs of any description whatever?

No physician, whatever his prejudices in favor of the administration of medicines either allopathically or homœopathically, but will admit at once, and without a breath of reservation, that any human organism suffering from disease would be better off if the cause of such disorder could be got at and removed without drugs, than if it were combatted and counteracted by the mildest system of medical treatment known to the profession.

In fact, we go further and assert that disease itself, of whatever kind, is but the effects of deleterious *drugs* that have found their way into the organism, either with the food and drink taken into the stomach, through the absorption of poisonous germs into the circulation from the intestinal canal, by the inhalation of disease-producing matter floating in the air, or by the infectious absorption of poison through the external surface of the body, or through punctures of the skin, as in the case of snake-bites, etc.

These disease-bearing drugs may be of any kind or specific character, and may find their way into the vital circulation through any of the channels named, and may produce any of the numerous forms of disease known to pathology; they are drugs, nevertheless, and all the same, though not specially administered by a physician, for the effects they produce.

But when such disease-producing drugs chance to find their way into the circulation, and precisely like purposely-administered drugs of a similar nature produce their characteristic diseased conditions, the disciple of Esculapius at once attacks this abnormal condition by another disease-producing drug of a similar or dissimilar character, and for the sole rational purpose of combatting and neutralizing the absorbed drug which produced the original disease.

How much better, however, could the original disease-producing drug thus accidentally or carelessly absorbed, be forced out of the circulation by the natural eliminating and excreting processes of the human constitution without incorporating any neutralizing drug into the same vital circulation to make war on the abnormal element, and thus, by the conflict of opposing drugs, to weaken the vital forces and elements of the organism and thus upset the nervous system for its work of perpetuating human life?

That the poisonous germs of disease absorbed into the vital circulation, through whatever channel and from whatever source, come strictly under the head of drug action, requiring other and counteracting drugs to be absorbed through the same or through some other channel, according to the old system of drug medication, all medical practitioners are compelled to admit by their own various methods of neutralizing disease through the administration of just such drugs, many of which are deadly poisons.

These drugs are administered by the very same channels through which ordinary disease-producing drugs chance to find their way into the circulation, namely, through the mouth and stomach, through inhalations, through external absorption and through epidermic injections. And all these methods of conveying

remedial drugs into the circulating fluids of the body, are simply for the purpose of producing a milder but neutralizing form of disease by which to combat and counteract the prevailing or more dangerous form.

Even the distinguished French chemist, Brown-Séquard, has carried this theory of producing one form of disease to cure another so far, that he is now experimenting on a drug constituted of the most filthy and disgusting animal ingredients that can be obtained for epidermic injections, thus to counteract the disease, as he calls it, of senility, second childhood, or premature old age.

He names this abominable stuff the "elixir of life," and will, no doubt, induce thousands of believers in drug-medication to arm themselves with epidermic syringes such as are secretly carried by those who are suffering under the morphine habit. He seems to believe with Bob Ingersoll, that health ought to be "catching" as well as disease, so he has determined upon injecting into the vital circulation an organic compound of the very essence of disease so intensely effete as to pass over the boundary line and become the essence of health, or the elixir of life!

To show that we are not making all this up on the distinguished Brown-Séquard, we clip the following from a recent issue of the *London Telegraph*:

"According to a communication recently addressed by the eminent scientist, M. Brown-Séquard, to the French Academy of Medicine, it appears that he has prepared a concoction warranted to infuse fresh doses of vital energy into constitutions shattered by age or illness. As yet, for there is no public record of its trial as a recuperative and revitalizing agent, all that can be said is that it is intrinsically compounded of revolting materials. The physiologist, it is stated, cuts out certain parts of living animals, such as guinea pigs, and the pieces of quivering flesh, pounded together by the pestle and mortar of pharmaceutical commerce, are made into a kind of paste with water. The essence of this compound is then injected under the skin of the patient with a syringe similar to that employed by the votaries of morphine. It is needless to say that the results of M. Brown-Séquard's experiments are awaited with eagerness by elderly Fausts."

The project of M. Séquard is but drug-medication gone to seed, and we should not wonder if instead of the "elixir of life," that he kills the first man who submits to the operation. We trust, however, that he will test it on a good supply of guinea-pigs before trying it on a human being, unless, perchance, it be some unfortunate fellow condemned to the guillotine.

The only approach toward the "elixir of life"—that which to any extent will insure a rational and tangible increase of longevity—must consist in some efficient means of removing the germs of disease from the vital circulation, and then keeping them removed, rather than adding them to it, whether they be the disease-producing drugs of pharmaceutical commerce, or the less popular drugs of putridity, poison and decay, which are continually finding their way into the circulation through the various channels of absorption without being specially and authoritatively prescribed and administered.

Such a method of purifying the circulation

and keeping it pure, will dispense with all drugs in nine-tenths of present human ailments, and we have no doubt will advance average longevity in time far beyond the most favored present specimens of our race. And this method of purifying the vital circulation from so much of its disease-bearing germs acquired by absorption, as to permit normal nature, under good discipline, to accomplish the rest, is exactly what our new system of hygienic treatment to be unfolded in this volume contemplates, and, as we conscientiously believe, actually accomplishes without pharmaceutical drugs of any description.

Let us look for a moment at the system of drug-medication in some of its special bearings on the human organism. Take as a specific case the disordered condition of the kidneys, known in its more advanced stages as Bright's disease, and what have our learned medical practitioners to say about it? They do not claim to be able to cure it permanently by the administration of drugs.

No one even of the specialists in that class of diseases, with whom we have conversed, pretends to promise a permanent restoration especially after the disease has so far advanced as to assume its specific characteristics. True, they profess to alleviate the sufferings of the patient by means of certain diuretic and analogous medicines and thus they many times actually do stave off for a time the threatened collapse of those vital organs of the body.

But all this time these very remedies are making a desperate drain upon the other vital resources of the organism for the necessary reinforcements requisite to keep off the inroads of the relentless enemy.

Soon, however, these reinforcements become exhausted; the enemy, who has never for one moment been routed from his intrenchments, but merely bothered, so to speak, in his sapping and mining operations by the continual slaughter of the vital recruits that have been thrown like brave soldiers against his resistless bayonets, finally becomes master of the situation, the kidneys become paralyzed in their structure and cease to perform their functions, the enemy triumphs, the doctor has done his best, the drugs have wrought their most effectual but at the same time ineffectual work, the papers announce another death from Bright's disease of the kidneys, and the mourners go about the streets.

But what of the new treatment, as announced in this volume, and which, in a few pages, sets forth in the clearest possible language how this disease, with its kindred ailments, can be annihilated even in the advanced stages, and how its cause can be removed without drugs of any description? Why, that treatment challenges the most rigid scrutiny on the part of the learned of all branches of the medical profession, and invites them to show one reason why under its application another man on this whole earth needs to die, or even to suffer for a single week, in consequence of any form of any kidney trouble if taken in any reasonable time.

This new treatment simply holds out to suffering humanity and to the unprejudiced medical practitioner, a means of relief for every form of kidney trouble known to human experience, removing its cause without pain or expense to the vital forces of the system, all within a single night (with the exceptions of allowing time for the parts

to heal), during the sweetest slumber, and that, too, by an original and simple discovery, which has escaped the scrutiny of the world during all the past ages of medical science.

Such a claim we admit savors very much of the boasting of a lunatic, but we are only echoing what the most learned doctors, who have been let into the secret, have confessed in our presence, namely, that this discovery [as now set forth in our Health-Pamphlet from page 25 to page 30], for the cure of every form of kidney trouble, is entirely new to pathological, physiological and therapeutical science. (See June MICROCOSM, page 109.)

#### ADDITIONAL EDITORIAL REMARKS.

Since our Health-Pamphlet was printed, embracing the substance of our physiological and pathological discoveries, including the details of the new treatment, we have received thousands of letters bearing in one way or another upon the subject matter of those revelations. Pamphlets have been ordered and sent to all parts of the United States and Canada, and hundreds of these purchasers, having tested the treatment personally for almost every known form of disease, have sent to us in return the most enthusiastic indorsements of the discovery ever read concerning anything, as witness recent numbers of the MICROCOSM. So flattering have been some of these testimonials, even from members of the medical profession, that we would not dare to venture their publication, though urged by our friends to do so.

Many persons write to us inquiring if the new treatment will meet this, that, or some other form of disease,—in most cases unusual forms,—and request a personal reply from us. Of course these replies would be impossible, even if we had nothing else to do. Most of the information, however, thus sought is to be found set forth in the Pamphlet, at least, in a general way.

We now simply repeat that the new treatment acts so radically and fundamentally upon the vital circulation, without the least danger to the most delicate constitution, that there is not a form of disease that flesh is heir to, which will not be affected favorably to the patient by an intelligent use of this method of treatment, which, in all cases, should be commenced gently and increased gradually as the individual's judgment and feeling may dictate. If we were able forty years ago to originate the whole process and details of the treatment, and carry them out personally to complete success at the first attempt, surely, with a full description of the general operation set forth in the Pamphlet, intelligent men and women ought to be able to contrive means of adapting the discovery to slightly varying circumstances. We are not all "built" exactly alike, to use an expressive modern slang, and hence a little judgment and common sense are always, in the language of Mrs. Toodles, "handy to have about the house." With the proper exercise of such judgment, we conscientiously believe, that no person, whatever his or her ailment, will fail to derive many times the cost of the pamphlet in actual value to general health, by adopting this treatment, as compared to the continuous employment of any drugs to be found in the pharmaceutical market. And even if no form of disease is visible or perceptible in the organism, the habitual use of the treatment, as a preventive alone, will pay for itself.



many times over through life, in the warding off of disease, in the assurance of permanent health, and in the numerous years of vigorous longevity to be enjoyed, not otherwise attainable. If we did not believe this with all our conscience and sense of responsibility to our generation, from what we know of the effects of the treatment upon ourself for more than forty years, we would not now be selling the Pamphlet which unfolds those health principles.

When we first announced this treatment in the April MICROCOSM, and foreshadowed the Pamphlet unfolding the same, the price (\$4) was considered by many as too high for a thirty-two page pamphlet; but now all this is changed since purchasers have come to reflect that this is but the price of a scrap of paper containing a doctor's prescription and a little medicine from the druggist, which though well intended oftentimes leaves the system of the patient worse than before.

The new treatment, on the contrary, as set forth in the Pamphlet, and which requires no future outlay for medicine, not only meets every emergency of ordinary human ill, but aside from its advantages in curing disease and promoting health and longevity, it has been conceded by the medical profession who have candidly examined it, to be worth all that is charged for it, as a physiological and therapeutical treatise alone, giving men and women who read it a knowledge of themselves and of the real cause of their physical ailments such as they would not be able to obtain from any other source.

In selling this Pamphlet we are obliged to require a "Pledge of Honor" from those purchasing it, not to show or reveal its contents outside of their own families. This is for our own protection, and as the only means by which our just rights in the discovery can be maintained. Doctors, of course, who purchase the Pamphlet are conceded the additional privilege of using the treatment with their patients.

Those who may chance to see this number of the MICROCOSM, and who may not wish to wait for a pledge to be sent before procuring the benefits of the Pamphlet, may write out the promise of secrecy substantially as above and send it with the \$4, thus obtaining the Pamphlet by return mail with a regular pledge which they can sign and return at their leisure.

Agents will be supplied with blank pledges free of cost, and should any local agent find a person immediately needing the benefits of the treatment, such agent may loan him or her his own Pamphlet on signing a Pledge of Honor and paying the \$4, till such time as a Pamphlet can be obtained from this office by mail. Still it is far better for local agents always to keep a supply of Pamphlets on hand ready for such emergencies. These Pamphlets will be sent by mail to agents at a specified price for cash (to avoid the cost and labor of all running accounts), and also a supply of our important canvassing circular to put into houses, free of cost, except postage,—eight cents per hundred copies.

We can not guarantee local agents exclusive rights to extended territory, such as counties, but we let each agent work where he pleases. A person, however, who will agree to canvass and put our circulars into the houses of a town or city, will have it set apart for him on our list of agencies, and we will not send circulars

for billing the houses to any other person for that place if we know it. This is the best we can do, as agencies for counties require too much detail of bookkeeping in our present crush of business.

Local agents should urge every purchaser of the Pamphlet to add fifty cents as a subscription to the MICROCOSM for one year, as this journal contains much of interest in the same general line of thought.

All subscriptions begin with the first number of any current volume. We have all the back numbers of the present volume on hand. No one can say that this paper is not worth fifty cents a year.

Read the voluntary indorsements of our Health-Pamphlet on the last two pages of this number. No such unsolicited testimonials were ever read in favor of any thing pertaining to human health and happiness. Two similar pages of indorsements from all parts of the country appear in both the June and July MICROCOSMS. New readers who have not seen those numbers can have them free of charge by so intimating.

There is not a reader of this number of the MICROCOSM who has not one or more friends at a distance who would be glad to receive a copy. Do not be selfish in the exclusive possession of a good thing, but send us such names of friends, one or more, and we will gladly mail them free copies of this journal.

A postal card is all-sufficient for this purpose, or for ordering a copy of our Pledge of Honor and our descriptive circulars for examination, should a person wish to see them before remitting for the Pamphlet. We desire all to be satisfied that they will get more than the full worth of their money before investing the \$4.

Address, A. Wilford Hall,  
23 Park Row, New York.

## PROJECTION AND GRAVITY ONCE MORE.

What Our Critics Think.

BY PROF. D. JAMES.

Dear Doctor,—In the June number of the MICROCOSM, you announce the cause of the retardation in the fall of projectiles, and assert that a ball projected horizontally *in vacuo*, would reach the ground or a common level "much sooner" than if let fall vertically from the same elevation.

Let us see how this new law operates:

A ball would fall sixty-four feet in *vacuo* in two seconds. To make the range of two miles in two seconds, it must be projected with a velocity of about 6000 feet a second. [Under such velocity it would reach the level in half a mile but for the air.—Editor.] But you say five or ten miles range would make no difference except to make the ball fall faster. [The greater the velocity the quicker it would reach the common plane in *vacuo*.—Editor.] To make a range of ten miles in two seconds the ball would have to be projected 30,000 feet a second, a velocity which the books say, is nearly sufficient to carry the ball entirely round the earth. [At that velocity, sixty-four feet high, it would reach the ground in *vacuo* before going a mile.—Editor.]

If projection causes the ball to fall faster, or helps gravity, then the farther a ball is projected the sooner it will fall. [This would be absolutely true in a vacuum, minus the curvature of the earth.—Editor.]

A ball projected in the air, is retarded in its

onward progress by the inertia of the air, and the range is proportionally diminished. [This is a mistake. The quantity of air passed through counteracts the pull of gravity more than it curtails the range of the projectile.—Editor.] But what has this to do with the downward pull of gravity any more than in the vertical fall? [We will show you.—Editor.] You seem to consider the projectile force as moving in a parabolic direction, when its tendency is in a horizontal direction, or rather a straight line perpendicular to the direction of the ball let fall from the top of the sixty-four foot tower. [The projectile force changes with the direction of the ball.—Editor.] The fall in either case meets with a like obstruction—does it not? [By no means.—Editor.] The projectile does not condense the air below it sufficiently to modify the action of gravity—does it? [Yes it does.—Editor.] Now, doctor, if, as you aver, the horizontal force does not modify gravity (except to aid it), why should the air diminish the velocity of fall any more in the projected ball than in the vertical one? [Because there is so much more air in the one case than in the other.—Editor.]

It appears to me you have failed to give the true cause of the difference in the time of the fall of the two balls. [Why don't you try to give it?—Editor.] There must be something in the doctrine of the "composition of forces." If so, the difference of fall or time of fall is easily explained by that law. [If it is easy, let somebody show it.—Editor.] This is what occurred to me, when I read your first treatment of the subject, and I do not yet see any argument subverting it. [I now see I was entirely wrong, and I wash my hands of it.—Editor.] Perhaps, I am stupid—but I can not allow you to take the back track unless the case is entirely hopeless. [It is entirely hopeless, as you will soon see.—Editor.] For the sake of those who are not troubled about spiritualism or "theosophy," please explain yourself again. The scientific eyes of shrewd enemies are watching you from every quarter. [Let them watch.—Editor.] Yours truly,

D. JAMES.

BY PROF. HENRY C. COX.

CHICAGO, ILL., June 10th, 1889.

My dear friend, Dr. Hall,—I have read your article on falling bodies and projectiles, in the June MICROCOSM, with a good deal of care, and have reflected upon its arguments not a little; and, at the risk of appearing before you as one sadly wanting in intellectual acumen, I am forced to say that I can not see the force of the reasoning you employ.

A ball let fall from a height of sixty-four feet, must displace a cylinder of air sixty-four feet long and of the same diameter as that of the ball. A ball projected horizontally from the same elevation, while it may displace a thousand times that amount in the direction of its projection, has only the vertical cylinder of sixty-four feet to move out of its way (in minute sections) in its descent to the earth. I can't see that its having to displace eight, eighty, eight thousand, or eight million times as much air in the direction of its projection has, of itself, anything to do with the descent of the projectile toward the earth. \* \* \*

Yours devotedly, HENRY C. COX.

REPLY BY THE EDITOR.

Several other critics besides these two friendly

correspondents have taken similar views of the argument we presented in the June MICROCOSM, based on the observed difference of time in the fall of two cannon-balls,—one dropped vertically and the other projected horizontally.

Our position, as those can see who will take the trouble to re-read our article, was, that the sole reason why a horizontally projected ball takes longer to reach a base line from a given height than a ball dropped, is the greater quantity of air the projected ball has to penetrate and displace,—being about eighty times as much in a distance of one mile, fired from a perpendicular elevation of sixty-four feet.

The reader has the substance of what is urged against our position in the kindly letters of Professors James and Cox given herewith. In a word, their objection to our position is, that the quantity of air displaced horizontally by the projected ball can have no sort of effect up the vertical pull of gravity and the fall of the projected ball, since there are only sixty-four feet of air to be displaced in either case, vertically, between the ball and the earth.

It makes no sort of difference, as Prof. Cox expresses it, if the projected ball has to pierce and displace "eight, eighty, eight thousand, or eight million times as much air in the direction of its projection," since there will be only sixty-four feet of air to be displaced vertically in both cases.

Thus, to make sure that the reader will not fail to catch the exact point in dispute, we give this condensed re-statement of the case. Now for our reply:

It seems most strange, and even singular, that both Prof. James and Prof. Cox,—close and critical Substantialists as they are,—should start and maintain their entire argument upon a radically false assumption, namely, that there is only sixty-four feet of normal air between the projected ball and the ground in traveling a mile. They have entirely overlooked and ignored the fact that there is a shell or tube of intensely compressed air below, above, and on all sides surrounding this projected ball except in its rear, where, of course, there is almost a vacuum.

No one will dispute for a moment if this compressed wall of air could be confined to one side of the ball during its flight, instead of surrounding it, that the projectile would thereby be deflected in an abrupt curve in the opposite direction. This is demonstrated by the well-known fact that a very slight preponderance of atmospheric compression on one side of a base-ball (caused by the ball's rotation in that direction), is a sufficient cushion to send the ball curving several feet in the opposite direction, thus to mislead the batsman and cause him to strike like one that beareth the air.

Now if the slight preponderance of atmospheric compression on one side of a base-ball, caused by the slow rotary spin a pitcher is capable of giving to it, is sufficient to curve the ball several feet from its course in the short distance from the box to the home-plate, what would be the effect on a cannon-ball under its enormous velocity and the consequent intense atmospheric compression thus produced, could all this increased density by any means be confined say to the lower side of the ball in its flight? Why, it is perfectly plain that this cannon-ball would commence

at once deflecting into an upward curve, so abrupt as finally to expend the projectile force of the powder and end its flight directly away from the earth, at last to be drawn back by gravity!

I state the case in this way, by assuming the compression of the air all to be on one side of the projectile, in order to impress the minds of readers who are not apt to reason closely upon questions of physical science. But we must now remember that this intensely compressed cushion of air, caused by the flight of the cannon-ball, instead of being confined to one side, constitutes a tube of abnormally condensed atmosphere, *tending to prevent diversion or deflection of the ball in any direction from its straight course, and in exactly the same ratio as would the compression, if all on one side, divert the ball to the opposite direction.*

Thus, that portion of this horizontally curving tube of compressed air, which is below the ball in its flight, counteracts the pull of gravity immensely more than would a normal atmosphere such as the vertically falling ball has to encounter; while this surrounding wall of compressed air becomes denser, and thus more and more counteracts the pull of gravity, the swifter the ball travels or, which is the same thing, *the greater the quantity of air the ball has to displace in a given time.*

It seems almost like an insult to the intelligence of our readers to argue, if compressed air, acting against one side of a projected ball, will divert it in an opposite direction, as seen so clearly on every base-ball field in the country, that, therefore, a tube of intensely compressed air on all sides of a projected ball must tend to prevent deflection or diversion in any direction by the application of extraneous force. Hence, we assume that gravity can not deflect such a ball as easily as it would otherwise do if it were not incased in a compressed tube of air; whereas if there were no air at all in the course of the projectile then there would be nothing to prevent the normal action of gravity in bringing it immediately to the earth.

But here comes in the other factor—*projection*. If there were no atmosphere, then reason must teach us that both the projected and dropped ball (could projection remain horizontal), will reach the given plane in precisely the same time if no other force interferes or aids in either case. Horizontal projection, pure and simple, that is projection at exact right angles to gravity, could it be so maintained or kept *horizontal*, would neither oppose nor help gravity in the slightest degree.

At the least elevation of the cannon above the horizontal plane, it is perfectly clear that the projected ball would oppose gravity just that much. At the slightest depression of the cannon below the horizontal plane it would aid gravity just that much, thus bringing the ball that much quicker to the given plane than gravity alone could bring it. This is so clear and simple that it now looks almost like child's talk to reiterate it.

Thus, we come back by force of logic and science to our position as assumed in the June MICROCOSM, namely, that if there were no atmosphere to form resistance against deflection, a horizontally projected ball, at whatever velocity, would reach the given plane vastly quicker than one dropped from the same elevation, *because such ball is virtually projected*

*below the horizontal plane before it travels one foot from the mouth of the cannon, and consequently that every instant thereafter its projectile direction is more and more toward the perpendicular, and hence more and more in aid of gravity.* On this position we are ready to stake our posthumous reputation as a physical investigator.

Remember, that the projectile force of the powder, though it *starts* horizontally, is instantly stored up in that cannon-ball, and that any extraneous force, such as gravity, which tends to deflect that cannon-ball to a downward angle, however slight, deflects also its stored-up force to a corresponding angle, *the same as if the cannon had originally been fired below the horizontal plane.* Let us prove this.

No one disputes the fact but that a cannon-ball fired from a given elevation vertically downward would outstrip its fellow dropped from the same height, because the projectile force aids gravity. Is not this true? Nor would any one question the same result if the ball were fired at an angle of  $45^\circ$  downward if there were no air to be displaced.

In like manner gravity would be proportionally aided, by which to cause the projected ball to outstrip the dropped ball, by every fraction of a degree of depression of the cannon below the horizontal plane, except for the resistance of the air.

Then why not be able to grasp the self-evident fact that gravity would be aided in the same manner by purely horizontal projection, *since this force, which is horizontal at the start, is instantly converted by gravity into a projectile force inclining toward the perpendicular, and more and more so the longer that projectile force continues?* Answer this argument who can.

Thus conclusively it follows, that only for the resistance of the air the horizontally projected ball (which in a single foot is changed from horizontal to diagonally downward projection) must reach a given plane, at whatever velocity projected, sooner than the one dropped from the same elevation. This must be so in the very nature of things, or else projection downward does not assist gravity, a supposition so preposterous as not to be entertained for a moment.

Now, anomalous as it must seem, we believe that a cannon-ball, fired horizontally from an elevation of sixty-four feet with sufficient force to carry it five miles through our air before reaching the base-plane of the tower, would, if there were no air to sustain it, almost instantly curve downward to the earth under the combined action of gravity and the rapidly changing direction of projectile force. It is the intensely compressed tube of air surrounding a cannon-ball in its flight that sustains it for so long a time and keeps it from falling for so great a distance.

We even improve upon the radical character of our June article by asserting our conviction that horizontal projectile force, applied to a ball at the top of a sixty-four foot tower sufficient to carry it ten miles in our air, if such a thing would be possible, before reaching the base-line, would not carry it a single mile in vacuo before bringing it to the earth; while we feel sure it would strike the ground in less than half the time required for the ball dropped from the same height. So the reader can see how much there is new to be dug out of this



long mooted discussion from the novel standpoint we assumed in the June *MICROCOSM*.

By this reasoning, the swifter the horizontal projection, according to our theory, with no atmosphere to sustain the ball, the quicker must the ball reach the base-line, and the more it must outstrip the one falling vertically; though the greater the horizontal force applied to the ball, even were there a complete vacuum, the farther it would go before reaching the base-plane. This all seems to result mechanically from calculating the rapid increase of changed horizontal projection diagonally downward, proportioned to the initial projectile force given to the ball.

That the horizontally projected ball in vacuo, whatever its velocity, must outstrip the one falling vertically, is as certain as that projectile force will aid gravity at all when exerted in the same, or partially the same, direction; but how much the horizontally projected ball, under different velocities of projection, would outstrip the one falling vertically, can only be arrived at, even approximately, by comparative reasoning aided by careful mathematical calculation.

Fortunately for our main argument, however, upon which we have here been obliged to defend ourselves, Prof. Cox in his very thoughtful paper on base-ball curves, in another part of this number, has supplied us with the very ammunition we stood in need of by which to answer his own critique upon our June editorial.

#### LIGHT AND SOUND AS SENSATION.

BY JOHN C. DUVAL.

In an article published in the *Popular Scientific Monthly*, the writer advocates the doctrine that there is really no such thing as light—that it is simply a *sensation* produced on the organ of vision by the movement of *etherial waves* impinging upon it. Sound also he asserts, as a result of the same molecular action creating atmospheric waves which striking upon the organ of hearing, produces the *sensation* we term sound, and that it really has no existence outside of the organ. From these so-called facts he comes to the conclusion, that if there was not an eye or an ear in the universe to convert the *raw material* of molecular action into light and sound, the universe would be enveloped in total darkness, and a death-like silence would reign supreme.

I do not venture to dissent from such high scientific authority as the writer of this article, but I will ask him to answer one or two questions satisfactorily before I can give in my adhesion to the doctrine he advocates. If light is simply a *sensation* produced on the organ of vision and has no existence outside of it, how can it be asserted there is *anything* in the universe that has a real existence?

Our senses are all that we have to guide us, and as a general rule, their evidence is good, and should be accepted, until it is proven beyond all doubt that they have deceived us. To the sight, the sun appears to move around the earth, but as all known facts go to prove that the contrary is the case, we must admit that in this instance the evidence of sight is erroneous. Our senses are *not infallible*, but unquestionably they were given us for our guidance, and generally as I have said, their evidence is corroborated by all known facts.

I see, for instance, a piece of iron lying upon the ground, apparently eight or ten feet from me. It *looks* like a pound weight, and when I measure the distance to it, I find it to be eight or ten feet, and that it is a pound weight made of iron, since upon analysis I find that the substance of which it is composed has all the known properties and qualities of iron. In this instance (as well as in the great majority), the evidence of sight was corroborated by all known facts.

If light be only a *sensation* produced by "etherial waves" impinging upon the optic nerve, how is it possible to account for the fact that it is *divisible* into a number of different colored rays, of its action upon vegetable growth, its chemical effects upon a plate prepared for photograph, and of many similar effects in which the organs of vision are in no wise concerned? God said "let there be light, and there was light," and so too, no doubt, he said, let there be gravity, electricity, magnetism, vitality, etc., "and they were." Certainly, by such flats, he formed objects of some pre-existent substances and not of *nonentities*.

The molecular movement of the atoms of material substances is merely an assertion without a known fact to corroborate it, and even if such a movement could be satisfactorily proven, there is not one known fact that would lead us to suppose that this "mode of motion" of the atoms of one substance could have any effect outside of such substance. Constituted as we are, the evidence of our senses must of necessity be accepted until conclusive proof has shown them to be in error as in the apparent revolution of the sun around the earth; and until there is such or similar proof of the molecular movement of atoms, I shall believe that matter "en masse" and atomically is at rest (unless acted upon by extraneous force), and that light is a something the *existence* of which is evident through the organ designed to convey a knowledge of its existence to the brain.

El Paso, Texas.

#### The Library of Substantialism.

Is still offered complete by express for \$5, or by mail with postage (\$1.25) added. This library consists of the "Problem of Human Life;" the five volumes of the "MICROCOSM;" the first volume of the "Scientific Arena;" and the "Text-book on Sound,"—all bound in cloth—retail price \$11. For fuller description see last page of July *MICROCOSM* (last month).

#### Appleton's Encyclopedia.

We have a few sets of these valuable books, second-hand, but in good condition. Cloth, \$24; leather, \$30, by express. These are not the illustrated edition, but just as good for the student. No intelligent man can be without a good encyclopedia in his library.

#### PLEASE READ THIS PROPOSITION:

Any person into whose hands this *MICROCOSM* may fall shall, if they so desire, be put down on our books as complimentary subscribers for the remainder of this volume (*three more numbers besides this*), and at the close of the volume may continue, if they feel so disposed, after becoming acquainted with our magazine. This offer extends to everybody. Please tell your friends. EDITOR.

# THE TESTS AND TRIUMPHS OF OUR HEALTH-PAMPHLET.

We give herewith another installment of voluntary testimonials as to the value and achievements of our new treatment without medicine, as set forth in our Pamphlet on Health and Longevity. We admit that "Testimonials" of this kind in favor of various drugs and patent medicines have often been sought after and procured at whatever expense. We defy any person, however, to show that a single one of the following indorsements has been solicited or even known of in advance of its receipt, and to this end any person whose name and address is here given may be written to. We commence with the capital of the nation:

A. E. Miley, 6th Auditor's Office, Washington, D. C., writes:

"Dear Dr. Hall,—I have been using your Health-Treatment about one month. You may be good at guessing but you can not guess what I have been treating myself for. I will tell you. *Sore eyes*, with which I have been afflicted forty years. The relief I have experienced in this one month is simply marvelous, and I have no words adequate to express what I feel, believe and absolutely *know* in regard to the value of your discovery. In fact I do not believe that you are aware of more than a fraction of the ailments of humanity to which your remedy is applicable. In a word, I regard it as the great cure-all, of which we have heard and read, but which has never been found till the revelation appeared in your thirty-two page pamphlet. I called on my family physician two days ago, settled my bill, and informed him that it was the last money I ever expected to pay him. \* \* \* I confess I never read a work, big or little, so full of good sound sense and reason as this same unpretentious pamphlet. I will put it against all the medical works in print, outside of surgery, and much of that department of practice would be avoided by the general adoption of your discovery.

"Your sincere friend, A. E. Miley."

Eld. G. W. Studebaker, Fredonia, Kan. writes:

"A. Wilford Hall, Dear Friend,—Inclosed please find the money for five more pamphlets and postage for one hundred circulars and twenty blank pledges. I must try to let others know of this treatment which has proved so much benefit to me, especially as there are so many afflicted people here who need its advantages. I have been using your treatment only three weeks, and I assure you I feel *ten years younger* than when I commenced it. This begins to look like *longevity* in earnest. You have my thanks. Truly yours, G. W. Studebaker."

Rev. George Cook, Millican, Texas, whose recent stroke of paralysis was supposed to be fatal, as stated in the June MICROCOSM, gives his third indorsement of the treatment with his tenth order for pamphlets as follows:

"Dr. Hall, Dear Friend,—Please find inclosed a Money Order for four more pamphlets. So far as I have learned all who have received the pamphlet are well pleased, some saying that they would not be without the knowledge for any amount of money. My own health is better than it has been for years. If it were necessary I could easily get you several testimonials from here.

"Yours truly, George Cook."

Rev. Thos. Nield, Livonia, Ind., writes:

"At the time I received your pamphlet on Health and Longevity, I was suffering from internal piles. After putting your treatment into practice three times I bade my trouble good-by, and have not felt it since. I have only to add, from practical experience, during the short time I have owned your pamphlet, that I have more faith in your system of treatment than in all the medicines of all the doctors on earth combined.

"Yours very truly, Thos. Nield."

Rev. A. L. Cole, D. D., M. D., Santa Ana, Cal., sends his second indorsement of the new pamphlet after another month's practice of the treatment, as follows:

"Dear Dr. Hall,—I have nothing to take back from my letter as printed in the July MICROCOSM. Your treatment is the first expression of the science of therapeutics I have ever seen in print, or have ever put into practice that appeals to my judgment as unqualifiedly rational. It goes directly to the cause of all forms of disease and removes it by aiding and abetting nature, rather than provoking a conflict among the vital powers as in the case of drug-medication. This I call genuine remedial science. For nearly twenty-five years I have been a con-

scientively tormented invalid, and I can say in all candor and truth that the first real freedom from suffering that I have experienced in all this time, has been since adopting your treatment. I rejoice beyond words within my power of expression; and I honestly believe that under God you have done more in that pamphlet than all the doctors of the world for the relief of suffering humanity. The treatment in my own case is to me the wonder of wonders! The \$4 I paid for the pamphlet was the best spent money of my whole life. You are at liberty to print this which I declare to be the literal truth upon the honor of a man and a Christian. God bless you in your beneficent work. A. L. Cole."

The distinguished pulpit orator and evangelist, Rev. Miles Grant, Boston, Mass., writes, October 7th:

"\* \* \* Touching your wonderful discovery I take much pleasure in saying, I am delighted with its effects upon my system. I sent for it that I might know its influence on a healthy person. I have now used it about three months, and intend to continue its use during my mortal life. The treatment produces a general refreshing, invigorating effect,—sharpens my appetite, sweetens my sleep, and makes me feel as though I had a new lease of life. I have persuaded several of my brethren of the ministry to send for your Health-Pamphlet, and so far as I have heard from them they are exceedingly pleased. One of them said to me a few days ago, 'I would not take \$50 for it.—*It knocks the bottom out of disease.*' I can say for myself I never spent \$4 to better advantage than when I bought your pamphlet. Your brother in Christ, Miles Grant."

Dr. J. W. Graves, Parsons, Kansas, writes:

"Dear Dr. Hall,—After a careful reading of your pamphlet which came to hand a few weeks ago, I became so delighted with the far-reaching effects of its marvelous physiological revelations, that I at once ordered six of my patients, who were suffering with consumption, to commence the use of the treatment. I am happy to say that they are all improving and doing well. You have done a great work for afflicted humanity. Your fraternal friend, J. W. Graves, M. D."

Rev. M. Fernsler, Schaffertown, Pa., writes:

"Dr. A. Wilford Hall, Dear Sir,—Since receiving your pamphlet I have carefully tested your treatment upon myself. For more than twenty years I have been a sufferer. My trouble has been torpid liver, indigestion, pain across the kidneys, at times dizziness, with occasional heart trouble, etc. With gladness unpeakable I assure you I already find myself almost a new man; and I can never pay the debt of gratitude I owe you for the blessing you have conferred upon me. I want to help spread the knowledge of this discovery, and if you will send me some blank Pledges of Honor I will let my afflicted neighbors know about the great remedy that is in store for them. Very truly yours, M. Fernsler."

Alison C. Roe, Esq., Buchanan, Mich., writes:

"Dear Dr. Hall,—I have received and read your wonderful pamphlet on health and longevity. I am very thankful that I was somewhat acquainted with your writings, having read the "Problem of Human Life" and some numbers of the earlier volumes of the MICROCOSM. Had I not known of you through your previous discoveries in science, I fear I should have given little attention to this great and priceless physiological discovery which is destined to do so much for suffering humanity. You will hear from me again soon.

"Respectfully yours, Alison C. Roe."

L. E. Prickett, Pioneer, Mo., writes:

"I have been using your treatment for about two months with the most satisfactory results on my general health. When I first received the little book I opened it with an eager eye. My first glimpse caught the instructive engraving on the second page, which alone threw a flood of light upon the general subject to be discussed. \* \* \* And now I can only say, what a pleasure and satisfaction to contemplate, that I am done swallowing distressing medicines for life.

Your very grateful friend, L. E. Prickett."

J. C. Massie, Jr., Fayetteville, Ark., writes:

"Your treatment has been a godsend to me. Few men have spent more money for medicine and doctor's bills during the last nine years than I have. But during the two months that have elapsed since receiving your pamphlet on Health and Longevity, I have not spent a single penny in that way, and never expect to in the future. I would rather have the knowledge which your

pamphlet unfolds than that required for securing a diploma from the best medical college on earth.

"Yours truly, John C. Massie, Jr."

E. J. Morrison, M. D., Gun City, Mo., writes:

"Dear Dr. Hall,—I have been using your health-treatment for going on two months, and I can not sufficiently express my gratitude to you for your invaluable discovery. I have been a great sufferer from indigestion, constipation, torpidity of liver and a wearing cough for several years. I have fought the inroads of these troubles with desperation, using every known remedy. I paid one specialist \$100 for a treatment without any beneficial effect. I could get no refreshing sleep, constantly dreaming of failing, drowning, etc., and thus nightly enduring the most torturing mental agony. Now, since using your treatment I sleep soundly, my cough does not disturb me once in twenty-four hours, the bad taste which I have experienced for years is gone from my mouth, my circulation has vastly improved, my feet are warm, which before were always cold, my mind is clear, and since the first application of your remedy I have not had an unpleasant dream. I have practised medicine for ten years, have had many surprises, but have never had one so valuable, astonishing and revolutionary as that on reading your pamphlet and adopting your treatment. I never expected to get well, but thanks to this revelation I see excellent health before me in the near future."

"Truly yours, Edward J. Morrison."

Thos. L. Phillips, Minneapolis, Minn., writes:

"Dear Dr. Hall,—I consider it my duty to write you unequivocally approving of your wonderful pamphlet and the treatment therein unfolded. I have been severely troubled for ten years with dyspepsia, and what I have suffered no tongue can tell. I have tried various remedies, but with no benefit. At last I heard of your health-pamphlet and sent for it, and at once adopted your treatment. I am very thankful to say that my first application of the new remedy without medicine was the last of my dyspepsia. It has not troubled me since. And now, Doctor, I am going to make known the glad tidings to others, and thus benefit suffering humanity. Send me a supply of pledges and circulars and some sample copies of the Microcosm. Four dollars! Nonsense! I would not take four hundred dollars this day and be deprived of its benefits. Your sincere friend, Thomas L. Phillips."

Rev. Chas. A. Cook, Bloomfield, N. J., writes:

"Dr. A. Wilford Hall, Dear Sir.—You will remember that about a month ago I called at your office and purchased your Health-Pamphlet. I have carefully read it, and regard the revelation it makes as wonderful. The discovery of this common-sense remedy for the ills of life must, as I believe, create a revolution in therapeutical practice. As I have been on the go much of the time since I obtained the pamphlet, I have had little opportunity for regular practice of the treatment, but three times have convinced me of its highly beneficial effects upon my system. In this city (Toronto, Canada) I have many friends, having formerly been pastor here, and to some of these I have been speaking and recommending your treatment as a wonderful discovery. Some of these you will hear from. When I return to N. J. I will call and see you. Yours most sincerely, C. A. Cook, Pastor 1st Baptist Church, Bloomfield, N. J."

Dr. H. P. Dooley, Forrest City, Ark., writes:

"Dear Dr. Hall,—I have suffered for years with sick headache from acidity in the stomach on account of undigested food. Your treatment has proved a great relief to me and to my family. We are all happy under the conviction that we shall have to take no more medicine. What a blessing to contemplate! I have an extended acquaintance in this country, having practised my profession for more than twenty years, and I shall certainly spare no pains in making known this wonderful remedy. Look out for orders from this section for your pamphlet. Dr. H. P. Dooley."

Rev. A. T. Odeneal, Lehigh, Indian T., writes:

"Dr. Hall,—Inclosed find Pledge of Honor with the money for Mr. Tucker, who has had the chills for more than a year. I loaned him my pamphlet after he signed the pledge, and the first application of your remedy destroyed his chills. I am now aiming to convince others. My wife and children have used the treatment for summer complaint and other troubles and it works like a charm. I have made medicine my study for twenty years and I never witnessed anything to compare with your treatment—for children and adults alike. I am more than thankful that I ever heard of it."

"Yours truly, A. T. Odeneal."

W. A. Harris, Centre, Texas, writes:

"Dr. A. Wilford Hall,—Your treatment is doing all that could be asked or expected for it in every case where it has been tested here. It is bound to create a sensation in this state, for the long-continued rain of about forty days is creating much sickness, keeping the doctors busy. As your pamphlet and its wonderful

merits become known, the demand for it must increase, and medicines of various kinds be less and less used. I am perfectly satisfied that you have made one of the greatest discoveries of this or any past age. Your orders from this section must soon begin to tell upon your exchequer. Truly yours, H. A. Harris."

James Bownds, Jeddo, Texas, writes:

"Dear Dr. Hall,—I have fully tested your treatment for the cure of disease without medicine and I want to say to you that I am greatly benefitted after using it only twenty days. I have decidedly increased strength, and can get around and do things that I have not been able to do at all for many years. I wish to say to you privately that it was my personal confidence in you from reading your writing that led me to send for the pamphlet without doubt or hesitation. I believed you had made a great physiological discovery, but now I know it. Your friend, James Bownds."

Eld. M. M. Eshelman, of McPherson, Kansas, Editor of *Israel at Work*, writes:

"I have now followed your health-treatment for several weeks, and friends who meet me remark: 'Why, you are looking better!' Certainly, I tell them, and feeling better too! and I now begin to realize the true value of healthful enjoyment. My brother, who is low with consumption, is already receiving benefit from your discovery. Yours truly, M. M. Eshelman."

E. J. Stockton, Park's Store, Ala., writes:

"Dr. Hall, My Dear Friend,—For more than six years I have been taking medicine from once to three times every day for liver derangement. This has been a great drain upon my limited means, besides the gloomy horrors of so much illness, and the use of so much disgusting medication. I commenced your common-sense treatment on the 19th of June and my relief has been as surprising as it has been gratifying. I take it every second night, and I now declare that I stopped taking medicine when I commenced the new treatment and I have not taken a particle since. I want a lot of your canvassing circulars and blank Pledges of Honor, and I will go to work and let my afflicted neighbors know about the pamphlet."

"Your grateful friend, E. J. Stockton."

E. S. Hall, San Buenaventura, Cal., writes:

"Dr. A. Wilford Hall,— \* \* \* I find myself very much improved under your new treatment, and feel convinced that in due time it will work wonders."

"Yours truly, E. S. Hall."

T. D. Kirk, Yuba City, Cal., writes:

"I have been using your treatment since receiving the pamphlet some weeks ago, and am much improved in health. My son, who was troubled with indigestion, seems entirely cured. Yours truly, T. D. Kirk."

E. P. Brigham, Deposit, N. Y., writes:

"I am so much pleased with your treatment that I would not sell the pamphlet, if thereby the knowledge of the discovery should be lost, for one hundred times its cost. \* \* \* Yours truly, E. P. Brigham."

Arthur Day, Dundee, Mich., writes:

"We are using your treatment regularly, and find it extremely beneficial. I have been much troubled with malaria, and have become tired of taking quinine. I take none now since adopting your remedy. My wife has used your treatment till her system has become entirely renovated from her scrofulous trouble which has greatly afflicted her. She even treats our baby in the same way, and it is thriving under the treatment. Your discovery is undoubtedly of far-reaching benefit. \* \* \* Truly, Arthur Day."

R. D. K. Price, Latonia, Ill., writes:

"I am using your treatment with great improvement to my health. I have been approaching consumption, in about your own condition when you made the discovery forty years ago, and for two years past I have made an apothecary shop of my poor stomach, with only temporary relief. I thank you for the instruction your pamphlet has afforded in my case."

"Yours, very truly, R. D. K. Price."

#### NOTICE TO LOCAL AGENTS.

"We have issued an edition of the 'Extra' MICROCOSM, having no reference to our own business address anywhere in it, so that agents can use it exclusively in their own interest for general distribution, with their own address written or stamped on the margin. Free, except postage,—one cent per copy."

"We have also issued a large poster of similar character and on similar terms, for local agents to post up in stores, shops, hotels, etc., with their own name and address at the bottom. This poster is full of the best indorsements of our Health-Pamphlet from all sections of the country. Same copy sent free."



# The Microcosm

A MONTHLY JOURNAL OF SUBSTANTIALISM AND COLLATERAL DISCUSSIONS.

THE ORGAN OF THE SUBSTANTIAL PHILOSOPHY.

A. WILFORD HALL, Ph. D., LL. D., Editor and Proprietor.

(Author of the "Problem of Human Life," "Universalism Against Itself," Editor of the *Scientific Arena*, &c., &c.)

ROBERT ROGERS, S. L. A., Associate Editor.

Address all communications to A. WILFORD HALL, 23 Park Row, New York.

Vol. VI.—No. 10.

SEPTEMBER, 1889.

50 Cents a Year.

Entered as second class matter at the New York Post Office.

## SUBSTANTIALISM versus THE MOTION- THEORIES OF SCIENCE.

BY THE EDITOR.

A modern writer on physics has said, "there are but two things in the universe—*matter* and *motion*—all the rest are the phenomena of these two." Substantialism on the contrary teaches that there is but one thing in the universe and that is *substance*. All other things which exist as entities are but divisions or departments of this one entity or universal substance. Of this classification *matter* is one of the grand divisions, while *force* in some form is the other,—these two in their broad sense, both being real entities, constituting all there is of entitative existence; while *motion*, *per se*, is no more an entity or a thing than is time,—the one being *position in space changing*, the other being *duration in space changing*.

The phenomena of the universe are all embraced in the two grand divisions here limited, namely, *motion*, or the position of things in space changing, and time as persistent and passing duration. Phenomena embrace the conditions of all things which exist. Entities and their conditions, however, are entirely different, and should rigidly be kept distinct. Much confusion exists upon this subject in the minds of physicists, and it is the mission of Substantialism to bring order and harmony out of this confusion.

The foundation of the substantial philosophy is the basic proposition that a vast proportion of the entities of the universe is not matter at all but absolute immaterial substance. A few unanalytical minds among modern scientific investigators, muddled and confused by the teachings of the text-books, still persist in asserting their incapacity for grasping such an idea as an *immaterial substance*, though thoughtful physicists are becoming familiar with this now absolutely necessary distinction in the classification of things that exist.

A few professors, standing well among the colleges, of which Prof. Stevens, of Brooklyn, N. Y., is a type, have wrought themselves into the belief that nothing in the universe can exist as an entity save matter in some form, or in some degree of density or tenuity; and hence, that matter and substance are simply synonymous terms. Viewing the entities of the universe in this light, and this view having prevailed among modern physicists for many years past, it is not at all surprising that materialistic science has come to reign almost

supreme in our colleges, universities, and lesser educational institutions; nor is it to be wondered at that scientific education of the modern stamp tends so directly to covert if not outspoken skepticism concerning the verities of religion and the realities of a future state of existence.

The personal existence of the soul separate from the material body can only be assumed or maintained on the supposition that the mental and spiritual part of man is a substantial entity in direct conflict with the basic idea of materialism, assuming as it does that *matter* and *substance* are synonyms. Hence, all logical thinkers who believe with Prof. Stevens, and who declare their incapability of conceiving of such an idea as an *immaterial substance*, must of necessity be skeptics concerning a possible personal existence of the soul separate from the body; and from the same basic reasoning must at once logically gravitate into bald atheism.

Clearly, if the man, as an intelligent personal entity, capable of willing, planning, executing, etc., is incapable of a real, substantial existence separate from material conditions, then no logical mind can conceive of the existence, on an infinite plane, of a spiritual, intelligent entity capable of planning and creating the universe.

If it is impossible for man, in the economy of universal existence, to remain an entity with personal, conscious capabilities after casting aside this material form, then manifestly the existence of a personal and intelligent first cause—the originator of the present orderly system of things—is also a logical impossibility. Materialism, as to the existence of man's soul, necessarily involves absolute atheism as to the existence of God.

If the soul, the mind, the conscious spiritual self-hood of man, is not a substantial entity, even considered as distinctly separate from the material body, then this conscious, intelligent, actuating force must be just what Prof. Hæckel in his "History of Creation" declares it to be, namely, the *vibratory motion of the material particles constituting our brain and nerves*. This is the last, the desperate, and the only resort of the materialistic school of thinkers.

To admit the vital and mental force of our being, by which our bodies are moved and made to do voluntary and intelligent work, to be a substantial entity, a real objective existence, would at a single blow shatter the foundation of their materialistic objections to the possible substantial and conscious existence

of the soul after death; for, if the soul as connected with the body is substantial, then manifestly it is a conscious, intelligent, as well as immaterial substance, and may remain a conscious, intelligent entity forever.

But still worse for the followers of Hæckel: If they should for a single instant be driven to admit the vital and mental force which moves and controls our bodies to be an intelligent, substantial entity, their atheism at that moment perishes, since an infinite intelligent substance becomes at once not only a clear possibility but a manifest and rational necessity. Why a rational necessity? Because, if a conscious and intelligent substance does really exist in man, as a vital and mental force capable of moving and controlling matter, the same of course can exist to an infinite degree; and if it can thus exist as a clear possibility then it must exist as a rational necessity, since such a conscious, substantial, and intelligent God is the only solution of the existence and order of the visible universe.

But to assume the mental and vital force which moves and controls our bodies to be but the *motions* of our material particles, as does Prof. Hæckel, is to assume this force to be absolutely *nothing* as intimated at the start. *Motion*, so far from being *force*, is the effect or result of force,—the mere position of a thing in space changing by force applied,—and it matters not whether the thing that moves be large or small—whether it be a particle of matter or a planet,—it can only change position by the application of force, which force in every possible case must be substantial because it produces a physical result.

But the materialist in making the life-force and mind-force which moves and directs our bodies, but the motions of the material particles constituting these bodies, involves himself in the ridiculous absurdity of assuming the *small* motions to be the cause of the *large* motions when in both cases the motions of matter, whether particles or larger bodies, can only result from the application of pre-existing and pre-applied force.

Why not put the big horse before the little cart and teach that the big motions—the movements of our massive bodies—constitute our vital and mental force, and thus make the little motions or the movements of the so-called molecules the effect? No, the whole tribe of materialists, led by the chair of natural science in the university of Jena, proclaim to the world that life and mind are only and solely the motions of our material molecules, and hence that our molecules must absolutely move without life or mind to impel them, since life and mind consist of their motion, and of course such life and mind can not exist till after the molecules have been started into motion by something else! Yet this silly twaddle, this "scientific" puerility, is echoed by materialistic professors, both in this country and Europe, as the advanced scientific thought of the age!

Why in the name of reason did not Prof. Hæckel proclaim to the scientific world that *life* and *mind* are nothing but the motions of our massive bodies—our head, hands, feet, etc? Simply because his common sense would have suggested to him, as it would to the youngest of his students, that if the motions of our head, for example, are what constitutes life and mind, then there must still be something back of life and mind to produce such motions!

He was too shrewd a physicist to put him-

self into such an illogical hole. Yet, marvelous to relate, he was just shallow enough to do exactly the same thing in declaring as he did that life and mind are nothing but the motions of our brain and nerve molecules. There is no man so stupid but he ought to see that if our whole head can not move without some force applied to it to produce the motion, then a molecule of the brain, however small, would be in the same fix. Yet this poor, driven atheist of Jena, in his desperate hatred of religion and in his blind prejudice against the idea of the existence of a God, was just dull enough and confused enough to suppose that by going back to some material body so small that he could not see it, he could succeed in annihilating the well-known physical law that always requires force behind or prior to motion, however big or little the thing to be moved; and that one of his ultimate brain-molecules, if there are such material bodies, can no more start into motion without the application of prior and extraneous force than could his whole stupid head.

An intelligent monkey, from whom he claims to have sprung, ought to know if he thinks at all on the subject, that if the motions of his head as a mass can not be the life-force which causes such motions, then the smallest molecule must also have life-force or some other force back of it as the cause of its motion.

The *motion* of a body, large or small, being the non-entitative effect of applied force, has no existence before the body begins to move, and such motion ceases to exist as soon as the body comes to rest, just as a shadow—the non-entitative effect of light—has no existence before the light-force is applied, and absolutely ceases to exist the moment the light-force is withdrawn. Hence *shadow*, as the effect of force, like *motion*, is absolute *nothingness*,—any effect it seems to produce, such as "scaring a horse," being really caused by the varying degrees and direction of the light-force applied.

Thus, motion being nothing,—the mere change of position in space,—it never did nor ever can produce any effect in mechanics, the entire effects attributed to it by superficial investigators being solely due to the force which causes the motion and to the actual contact of bodies thus moved.

Hence we see the monstrous absurdity of assuming the vital, mental, and spiritual forces of our being, which move and direct our material bodies, to be but the varied motions of our brain and nerve molecules as is so foolishly taught by modern materialists.

But Prof. Hæckel in formulating this physical nonsense was not so much to blame after all. He was instigated to it by the superficial and preposterous teaching of every college and university in Christendom, whether they be secular or religious institutions.

Do they not all teach that the *forces* of nature, by which material bodies are moved, and by which our senses are addressed and affected, are but the *motions* of material particles?

Do they not inculcate the doctrine that *light* and *heat* are but the vibratory motions of material ether,—a substance filling all space, surrounding the molecules of bodies, and possessing the mechanical properties of a "jelly?"

Do they not teach their students in every school in the civilized world, that *sound* is but the motions, to and fro, of the air particles driven into waves by the vibrations of the

sounding body; and that our sensations of hearing are but the motions of the auditory nerves, caused by the motions of the tympanic membranes, made to vibrate by the motions of the air particles driven against them? Of course, this is the teaching of physical science everywhere, and it is not, therefore, so very surprising or reprehensible that Prof. Hæckel should seize upon the universally prevailing motion-theory of force in its physical aspect and application, and thus logically apply it to the vital, mental, and spiritual forces which move and direct our bodies.

Consistent physicists, of the higher order of intellect, seeing no method of escape from the motion-theories of sound, heat, and light, necessarily carry the same principle of reasoning to other natural forces, such as magnetism and electricity, as witness the great scientific address of Sir William Thomson, before the students of the Midland Institute, at Birmingham, England, in which he declared that the force which moves a piece of iron at a distance from the magnet "can be nothing else than the rotary motion of the steel molecules?"

Is it any wonder, then, that atheistic materialists, who wish to destroy religion and annihilate the church, should seize upon the universal and accepted teachings of science and carry these motion-theories into the realm of vital and mental phenomena, thus consistently and harmoniously to explain the forces which move and direct animal organisms as but corresponding motions of their material particles?

Hæckel was unquestionably right and his position remains absolutely invulnerable if there is a shred of true science or philosophy in the motion-theories of heat, light and sound as taught in all the colleges, and as set forth in all the text books.

Hæckel knew his position was invulnerable if there was any truth in modern science on the nature of force, and hence his defiant sneers at the clergy, who are so stupid as to believe in the possible immortality of the soul, an imaginary entity which is nothing but the motion of our brain-molecules and which ceases to exist as soon as these molecules come to rest at death, just as the motion of air-particles, which constitutes sound, ceases to exist when these air-particles cease to vibrate, etc.

No wonder the clergy of both hemispheres were compelled to shut their teeth, and with amazed desperation bear these odious sneers in silence, not being able to frame any sort of reply to the overwhelming logic of the German atheist. And no wonder that such clergymen as Pentecost, Milne, and many others, should drift into materialistic atheism with the utter impossibility of making any reply to Prof. Hæckel, and with his ringing and triumphant sarcasms staring them in the face and vibrating against their tympanic membranes.

Until Substantialism took the field and stripped itself for the combat, no reply to Hæckel was even attempted. The clergy were dumb all over the world, and while they were thus humbled into forced silence the professors of all our colleges—religious professors included—were actively and energetically engaged in abetting Prof. Hæckel's destructive doctrine of the soul as a mode of motion, by demonstrating to their own students upon the blackboard that the forces of nature, such as heat, light, and sound, are but the motions of material molecules; and hence, that Hæckel

must be right as to the motion-theory of the other natural forces which we call life, mind, soul, spirit, etc.

Was there ever such a stupendous crisis impending over the religious world, and yet the masses of the clergy and the laity either ignorant of the danger or indifferent to the result, as when Substantialism entered the scientific arena? Hæckel was sending his "History of Creation" broadcast over the world, translated into every civilized language, proclaiming that "death ends all," and proving it by the most irresistible logic ever read, by reference to the motion-theories of force as taught in every religious college in Christendom. Atheists and materialists of lesser caliber caught up the doleful and unanswerable refrain, and with jeers at the clergy, laughed at the church, and congratulated themselves upon the fact now demonstrated by science that they were without souls and no more responsible to God than were the monkeys, reptiles and crustaceans from which they had evolved.

Yet, with all this pall of darkness hanging like a nemesis over the cause of religion, no voice was lifted to check the logical assault, simply because all argument was powerless to stay the cataclysm of destruction under the present reign of established science.

Substantialism saw this state of things, and resolved to lay the ax at the very root of the upas tree of materialism by assailing the motion-theories of modern science as the only remedy for Hæckel's blighting pronouncement that death ends all because the soul, like other natural forces, is but a mode of motion.

The history of the warfare with these motion-theories of science, which Substantialism then inaugurated and has since been waging for more than a decade of years, by which to break this central argument of the German materialists, will be found scattered through our Scientific Library, now consisting of ten volumes, as it includes the second volume of the *Scientific Arena*, immediately to go to press, and the present volume of the *MICROCOSM* now nearing its close.

We have not space here to present even a brief summary of the reasoning by which the motion-theory of force, as taught in our schools, is met and broken in these volumes. Suffice it to say that it became at the start absolutely essential, in order to meet and crush out the doctrine that our vital and mental force is but the motion of our brain-particles, that we prove force, *per se*, to be a substantial though immaterial entity in all its forms and manifestations,—as much a real substance as is the air we breathe, the water we drink, or the food we eat.

To make this work effective and conclusive, we were obliged specifically to attack the wave-theory of sound as the parent mode of motion of modern science, and as the most self-evident and apparently otherwise inexplicable of all the motion-theories of force. We went on the tacit concession of physicists that if the wave-theory of sound should prove untenable under fair investigation, then there would be no use in trying to defend any other motion-theories, such as those of heat, light, magnetism, electricity, etc., which had their origin in the prevailing theory of acoustics.

And it was also tacitly admitted that if sound-force, by which we perceive the sensations of tone, should be proved to be a substantial though immaterial entity, it would



follow that all force is substantial; and hence that conscious and intelligent vital and mental force, having a substantial basis, must possess the intrinsic and natural elements of indestructible and personal immortality.

How well this work has been done, both in overturning the motion-theories of sound and of the other forces of nature, as also of proving the substantial nature of all the forces, including those of sound, light, heat, life, mind, etc., the reader must judge for himself after a careful perusal of the various discussions relating thereto. See notice of our "Scientific Library" of eight volumes on last page of this number, and see also elsewhere the announcement of the immediate issue of Vol. II of the *Scientific Arena*.

PRIZE ESSAY No. 15.

The Forces of Nature.

BY C. L. CRUM.

All the primary colors combined in proper proportions make a white ray of light. If light was but the vibration of ether (an imaginary substance) and the different colors of the spectrum but different kinds and rates of vibrations, then there could be no such thing as adding two or more colors together. To prove light merely the motion of the ethereal substance would be to prove it a nonentity—nothing; and it is indeed puerile to pretend to add two or three "nothings" together and thereby change it into another kind or quality of nothingness.

But to consider light a substance, it can be correctly spoken of as adding or combining two or more primary colors and thereby produce another color or quality of light, just on the same principle that all the material substances are made up of the fifty-four simples, proportioned properly and each having its peculiar amount of cohesive force.

Nor is light a material substance; for if light that comes to us from the sun was material, this luminous body would have to emit particles of light of immense volume, or else when it had disseminated at every inch and fraction thereof, it would be entirely lost before reaching this earth over the distance of 95,000,000 miles. On this material theory of Newton's it would be reasonable to suppose that the globes of material light thrown off from each hemisphere of the sun in every instant in the eternal duration of time would at least equal the size of this earth. With this incessant expenditure the orb of day would soon diminish to absolute obscurity, unless reimbursed by some unknown process.

Then since light is not mere undulations of ether, and as it seems to be a substance of some kind, because it produces an effect, and there can be no effect without an adequate cause, and as it is irrational to consider it matter, because it penetrates the most impervious matter and two particles of matter can not occupy the same space at a given time, it follows: light is, like every force of nature, an immaterial substance.

Current science teaches that sound, as well as light, is merely the vibrations of the medium through which it passes. Then it is a logical conclusion that the more compressible the medium the less velocity the sound will have. But this is not true, for warm air is more compressible than a cooler, but sound, contrary to deductions from the superficial and equally

false premise of the wave-theory travels faster in warm atmosphere. This can't be attributed to the greater elasticity of the warmer air; for it is the elasticity of the medium that determines the velocity of sound. Air of any temperature would conduct the vibrations faster than water—a non-elastic liquid—non-elastic because incompressible. Iron is much less elastic than air, yet sound passes seventeen times faster through iron and four times faster through water than through air. Aside from the inconsistencies of current acoustics, the conclusion based on cause and effect, will prove sound to be a substance. Sound produces an effect, hence it must be an objective something of real definite proportions, though we can not call it tangible. Like light, it is an immaterial entity.

But there is another objection to vibrations, accounting for these phenomena, which is especially applicable to light. We could see nothing that was not self-luminous, for we only see opaque objects by the reflection of light from their respective outlines. There can be no such thing as reflection of waves while the original undulation, or the wave coming directly from the body, whether luminous or sonorous, is advancing. The first will be stronger and will "kill" the second or reflected wave. Try this experiment, if you do not believe the truth of what I say, by making waves in tangible, material water. There can be no reflection of any appreciable distance until the original waves have stopped.

This is bound to be true, for one particle of matter can not move in two opposing directions at one and the same time. So there can be but one note of a tune heard, since they all carve the atmosphere into different kinds of "condensations and rarefactions;" or perhaps the most likely result would be there would be no sound at all, if two different rates of vibration should commence at one time in close proximity.

Many arguments to prove the substantial nature of these forces could be reproduced from the writings of Dr. Hall, but I desist.

As all undulatory theories are primarily based upon the sound hypothesis, it is a fair and inevitable sequence that in disproving sound to be the vibration of its medium, the entire wave theories are undermined; and by the same process such forces as gravity, heat, electricity, magnetism, etc., were proven to be substantial entities. The fact that all these forces, and every other force of nature, are real substances can be substantiated or proven beyond dispute to an unbiased thinker.

Iron, rock, wood, water, air, etc., are substances. So, also, are sound, light, heat, electricity, magnetism and gravity; even life, spirit, etc., are substances, up to the Creator himself. But there is an essential and radical difference between the former of these and the latter. The former have weight or inertia, divisibility and other properties that the latter have not. But we will consider the difference between the envired state of that, in having inertia and the voluntary nature of this, in being free from the impediment. It is truly evident that the Creator intended and so provided that all forces of nature should act under peculiar conditions. Electricity, when furnished with a suitable conductor, will circumscribe the globe of its own involution; heat will follow its conductor involuntarily and with

infallible accuracy. Light needs no propelling power; but like the two just named, it leaps forth with its involuntary action, for it is a force itself. Immaterial substances must have no inertia, or else we can not account for the actions of God, for what force resides above Him to propel his actions? To argue that no force or immaterial substance can act without some superior force acting upon it, and so on back through the entire concatenation to God himself, would be to make man an involuntary, irresponsible being, not accountable for his own acts. Hence, universalism is true or God is a respecter of persons.

In once establishing the fact in the scientific world that all these physical forces of nature are substantial, you remove the entire foundation from under the temple of materialism. For their analogical deductions proving the life of man but the molecular vibrations of the brain is a nullity.

When materialists talk about *law* governing matter they at one efficient stroke shatter the entire superstructure of their Godless theory. Law is a rule of action prescribed by some *Supreme Authority*. When law is acknowledged, a law-giver is pre-eminently admitted.

There also is a theory in existence of materialistic origin that claims that life originated from inert matter, and that after it appeared it was nothing more than the vibratory motion of the brain and nerves. The framer of this hypothesis, if he had an honest heart, was evidently ignorant of some important natural laws. The elements that compose one kingdom can not step up into the one higher. For instance, the particles of the mineral kingdom can not evolve themselves a step higher into the vegetable; nor can the vegetable get into the animal by any inherent power it possesses. But inversely is true. The transmuting power of one kingdom is given to the kingdom above it. The vegetable can descend from its natural place in the scale of evolution and bring from the mineral nourishment, and by transmuting the particles of the latter they become a part of the former. So, also, with the animal and vegetable. The animal can descend and transmute the vegetable into itself. But there is no reversing the scale. This law runs, perhaps, into the spiritual realm, as indicated by Dr. Drummond, but without carrying it any farther it can be seen that a Creator can never make a creature the superior. Hence, life, the very essence of the animal kingdom could not have been created—"evolved"—from the mineral nor vegetable by inherent powers therein—since this would raise the creature above the Creator—a physical impossibility, for the bottom of each kingdom is hermetically sealed against all sub-kingdoms.

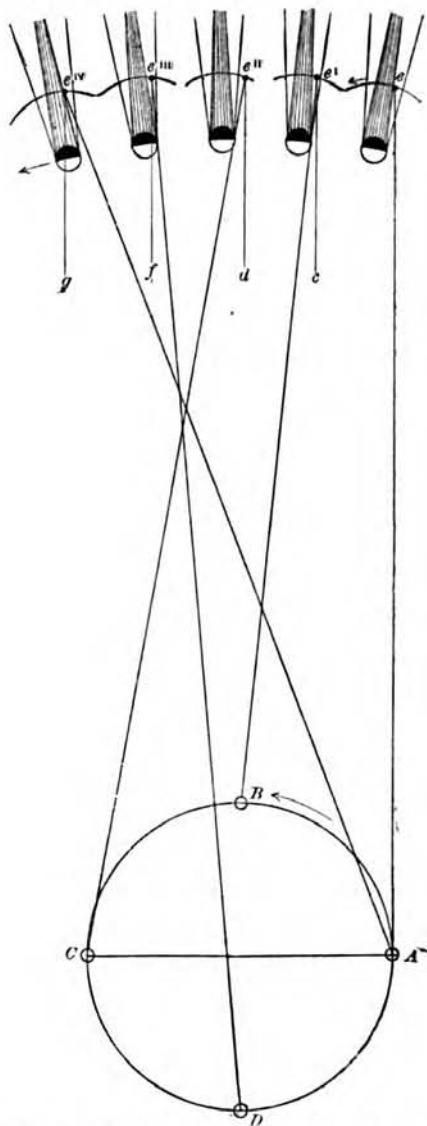
Hickory Flat, Miss.

Vosburg Miss., June 1, 1889.

Dr. Hall,—I have ventured to question the correctness of Roemer's discovery of the velocity of light.

Suppose his observations began when the earth was at A. and the time of the eclipse of the satellite at *e* noted. Since the orbits of the satellite, Jupiter and the earth are nearly in the same plane, the satellite must necessarily suffer "occultation" every revolution about its primary. This causes the satellite to be hidden sometimes by the body of the planet before it enters the shadow. Now, as the earth moves

toward B, the eclipses occur earlier each time, because the observer is going eastward faster than the planet, and the satellite is hidden sooner by passing behind the body of the planet. At B this earlier discrepancy amounts to, say forty-five minutes, and at C to ninety minutes. From C onward the eclipses occur later each time, because the motions both of the planet and of the earth favor such occurrence—the satellite must go further round each time to be hidden. When the earth arrives at A again,



Discrepancy at B = the angle B e' c; at C = C e' d; at D = D e''' f later, and at A = A e' v g later.

at the end of twelve months, there is found a latter discrepancy of fifteen or sixteen minutes, which is caused by Jupiter's having left his first position, and moved off 30° eastward. The earth must gain this back, and then the same phenomena are repeated. I respectfully submit that Roemer's difficulty is here accounted for, without a conjecture.

The several methods which have been adopted to demonstrate the velocity of light, as well as aberration, only prove that light is

retarded in its passage through the atmosphere.

Electricity is retarded more or less by different material substances. Why should not light be retarded also? Heat is retarded by material bodies.

I trust, Doctor, you will have the subject treated by an able astronomer and mathematician, and publish the result in the MICROCOSM.

One other thought: As force acts on force, is it unscientific to suppose that gravity affects the direction of light? Who knows that refraction is not thus caused?

Feazell, a consumptive, is trying your remedy with benefit. I influenced him to try it.

Yours Truly, D. JAMES.

#### OUR EXTRA MICROCOSM.

We have just issued and sent to each subscriber one entire number of the MICROCOSM as an Extra, for which we charge our readers nothing, though it is not included in the regular twelve monthly issues of the volume. Besides, it is issued especially in the interests of our Health-Pamphlet, and at the urgent request of those who are engaged as agents in making it known to the afflicted.

These agents insist that the articles printed in the April, May, June, July and August numbers of the MICROCOSM, including our "Personal Statement," the Preface, Introduction, First Chapter, etc., taken from the manuscript of our large work on "Health and Longevity," would be invaluable condensed into a single number as a document for placing the claims of our Health-Pamphlet concisely and consecutively before interested parties.

This Extra not only contains all these articles with other editorial matter, but includes the four pages of voluntary indorsements taken from the July and August numbers, thus making a most formidable presentation of the achievements and triumphs of this revolutionary treatment.

Any reader desiring a copy of the Extra, or who may wish one sent to a distant friend, can notify us by postal card and it will be mailed.

The demand for our Health-Pamphlet is still so on the increase that we have been obliged to add largely to our help and increase our room without even yet being able to keep anywhere near up with the demand. Indeed, with all the force we have been able to organize, with the efficient assistance of our Associate Editor, we are not able to keep within two or three days of catching up with our orders. Should any of these orders therefore seem to be behind hand, let no anxious correspondent think he is neglected or that his letter has been lost. We will fill orders as rapidly as possible, and in the order of their reception at this office. It will greatly facilitate the success of our local agents, and aid us in keeping up with our correspondence, if canvassers will order several pamphlets at a time at agents' price, even ahead of their local orders, and thus keep them on hand ready for emergencies.

There are two more regular numbers of this volume of the MICROCOSM to be issued. We beg of our subscribers not to be in a hurry to renew their subscriptions for Vol. VII, as we have no time now to receive the remittances and make the credits. We will notify our sub-

scribers when to send in their renewals. But send all the new subscriptions possible for the present volume, beginning with the first number—December. We have all the back numbers on hand, and can print any quantity required, as we have all the numbers electrotyped. Let no neighbor, who is willing to read this journal, be neglected, as copies will be sent free for such missionary work. Send for them.

#### FROM OUR EXTRA.

[The following introductory remarks to our Extra appear on its first page]:

This extra number, in the current volume of the MICROCOSM for 1883, has been compiled and printed in the interest of our Health-Pamphlet and for the spread of information concerning the new treatment unfolded therein.

From the issue of the April number of this journal onward, each MICROCOSM has contained more or less discussion concerning our Pamphlet on health and longevity, until many of our readers are now urging us to condense all these editorials into a single number, of the usual size and form, in order to afford new readers a bird's-eye view of the entire discussion and which any interested reader can grasp and devour at a single sitting. Our Extra accomplishes this very result.

So important do we regard the daily recurring developments of this Treatment for the cure of almost every known form of disease, as well as for the permanent preservation of health and prolongation of life, that we feel it our imperative duty to make everything else we do secondary to the widest possible promulgation of this discovery.

Though absolutely knowing the importance and even priceless value of this treatment as we did in its personal application to our own shattered constitution during forty consecutive years, yet we are free to confess that we had formed but a slight conception of its range of adaptation to the diseases flesh is heir to previous to commencing the distribution of our Health-Pamphlet among the afflicted.

Already we could fill scores of these pages with the most startling and enthusiastic acknowledgments of cures ever read by man, and which have been voluntarily sent to us as grateful tributes of praise for the marvelous benefits received. But we give only the last four pages to this conclusive phase of our Extra, taken from the July and August numbers, just as printed in those two regular issues. This will show the reader a mere specimen out of more than five hundred similar testimonials which already crowd our files, though it has been but about four months since the first pamphlet was sent off.

During this brief period many thousand copies of the pamphlet have been ordered from all parts of the United States and the British possessions, by Doctors, Lawyers, Ministers, Teachers, and by the afflicted of all classes and conditions of society and of both sexes. No such literary and therapeutical triumph has ever been placed on record since physiology was a science, and the like of this furor will possibly never be seen again.

But we must write no more in this vein. The reader is asked to judge for himself after a careful examination of the following pages. The pamphlet which unfolds the new treatment we sell invariably at \$4 by mail on the purchaser's agreeing by "Pledge of Honor"



not to divulge the treatment outside of his or her family,—doctors being allowed, in addition, the right of using the treatment with their patients. No one should complain of the price asked for this information when they consider that, if it is put into practice, it will save the owner of the pamphlet from all future bills for ordinary drugs and medical attendance, as well as from more than nine-tenths of the misery, inconvenience, and losses incident to ill-health.

We want energetic agents to spread the good news to the afflicted in every town and city in the entire country, to whom liberal terms will be offered by letter. To these local and general canvassers we will send pamphlets in any quantities at agents' prices, postpaid, on receipt of the money, as we can not afford the expense and trouble of keeping running accounts. The prices to agents will also be communicated by letter.

No person can become a local agent till he himself has first purchased a pamphlet at the regular price (\$4), and the first applicant for any town or city, who shows a disposition to push the sale of the pamphlet, will have the preference.

If the reader so desires, he can first send for a blank "Pledge of Honor" for examination before ordering the pamphlet. But if emergencies require it, he can write a promise of secrecy, as above, and send for the pamphlet without waiting.

Should any reader desire copies of this Extra MICROCOSM for circulation among friends, they will be sent free by mail, on receipt of postage,—one cent per copy. This Extra is not included in the regular twelve numbers of the volume. Hence, can not be sent at pound rates, but must be prepaid by one-cent stamps.

All correspondence, as well as all orders and remittances, must be addressed to

A. WILFORD HALL,  
23 Park Row, New York.

#### A PROBLEM TO BE SOLVED.

BY MRS. M. S. ORGAN, M. D.

It is a well-known fact that the wetting of a rope will cause it to shrink, and if the rope be a large and strong one, it will lift heavy weights and sustain them until it again becomes dried.

What is the true philosophical explanation of this mystery? Will Dr. Hall be kind enough to give the solution through the columns of the MICROCOSM?

REPLY BY THE EDITOR.

The problem here presented by our contributor would seem to be solved by considering two facts generally overlooked in connection with this mystery. 1. The original fibers of which a rope is constituted, such as hair, cotton, hemp, flax, jute, sea-grass, manilla, silk, etc., never become perceptibly shorter by being wet. 2. A twisted rope of any material becomes sensibly larger in diameter when wet, because the water penetrates between the fibers by capillary attraction and, on the principle of the wedge, pries them apart, thus considerably increasing the rope's diameter.

But admitting these two facts, how does the enlargement of the rope's diameter shorten it as a whole with such force as to lift heavy weights? The answer is quite easy: as the rope is enlarged and the individual fibers

which constitute it remain unchanged in length, necessarily they have farther to go in passing spirally around it in following its twist than around it before it was wet and when it was less in diameter. Hence, the rope, constituted of such fibers, must, as a whole, become shorter by the very act of enlargement.

One other fact before closing should be noted and explained: If the fiber constituting the rope be of a *bearded* character, such as wool, or even cotton, to a slight degree, the rope will become permanently shorter every time it is wet and dried, on the principle of *fulling*, the fibers working by each other and their slightly *barbed* surfaces by clinging together will cause an increased thickness of the rope partly to remain after drying. Should the fiber, on the contrary, be without this characteristic, as in the case of flax and silk, no appreciable *fulling* will take place, and the rope when dried will return to its normal length under tension, or very nearly so.

#### Reply to Prof. Timmons' Problem.

Vichy, Mo., July, 1889.

DEAR DR. HALL,—The following is my solution to the longitude and time question which appeared in the July number of the MICROCOSM:

For the sake of convenience we will suppose that Fort Dodge and Madras are located in the same parallel of latitude; say 15° north, then the International Date Line (I. D. L.) crosses that parallel somewhere near 130° east longitude.

Now, the trouble in this problem lies in not properly considering the relative position of the point where the midnight meridian crosses this parallel to the point where the I. D. L. crosses.

At the time the midnight point coincides with the I. D. L. point there exist but one day throughout the parallel. On the east side of the I. D. L. we find that the day has just begun, and as we continue to travel east it grows later and later, till we approach as near as possible to the I. D. L. from the west, when it is very late in the day and ready to dawn a new day as soon as midnight comes.

Then as midnight moves on to the west, on that arc of the parallel between the I. D. L. and midnight is a new day, while on all the remainder of the parallel is still the old day.

When it is ten o'clock, a. m., at Fort Dodge, 99° 45' 45" west longitude, it is midnight 110° 14' 15" east longitude, therefore neither the midnight nor the I. D. L. is between Madras and Fort Dodge, consequently the same day exists at Madras that exists at Fort Dodge, and the true time at Madras was ten o'clock, p. m., Saturday, May 18, 1889. Very respectfully,

J. A. FERRELL.

#### PLEASE READ THIS PROPOSITION.

Any person into whose hands this MICROCOSM may fall shall, if they so desire, be put down on our books as complimentary subscribers for the remainder of this volume (*two more numbers besides this*), and at the close of the volume may continue, if they feel so disposed, after becoming acquainted with our magazine. This offer extends to everybody. Please tell your friends.

EDITOR.

# Our Health Discovery.—A Slight Sketch of its History and Claims.\*

BY THE EDITOR.

Forty years ago,—at the time our physical condition prompted and inspired the series of physiological experiments which resulted in our complete restoration to health,—it is universally conceded by the medical profession that the specific and elaborated treatment set forth in our Health-Pamphlet was unknown to the world.

True, a treatment slightly in that direction, but without the least conception of its object or scope, was at that time well known to therapeutical science, and had been practiced since the time of Esculapius; though such slight approach toward our revolutionary departure, no more resembled or embraced the broad and sweeping remedy as described in our pamphlet than the occasional and incidental rubbing, kneading and pinching of our flesh, which has been practiced from time immemorial, resembles the radical and systematic "massage treatment" recently sprung upon the world as a distinctive physiological and anatomical remedy for disease. As Mr. Robert Craig, of Lebanon, Tenn., expressed it in the July MICROCOSM:

"It astonishes me that the M. D.'s have been sailing for centuries in that direction, always stopping short of the prize."

Yet a carping and envious critic, who was forced to admit the great value of our treatment as elaborated in the Health-Pamphlet, writes that he fails to see its novelty, just because of this slight resemblance here referred to. On the same principle he would fail to see any novelty in the homœopathic system of therapeutics introduced by Hahnemann over allopathy, worthy to be regarded as a distinctive system of medical treatment, since both systems resort to drug-medication.

We now come to a few plain facts in the history of our discovery that will be new to its friends and to the owners and readers of our Health-Pamphlet.

As announced in the December number of this volume of the MICROCOSM, we became acquainted with Richard F. Stevens, M. D., of Syracuse, N. Y., more than twenty years ago, or at a time when twenty years of our discovery had elapsed since we first put it into practical operation. Desiring, as we did, to unfold our physiological discoveries to some educated physician of extended medical knowledge and practice, we made a confidant of Dr. Stevens, partly to obtain an authoritative opinion as to the physiological value of the treatment, but chiefly to ascertain from a well-read medical student if the supposed therapeutical discovery was then new to the scientific world. We were no little gratified to learn from the doctor's unequivocal statements that he considered the treatment both novel and of the greatest physiological importance to mankind as well as to the science of pathology and therapeutics.

So valuable did the doctor regard it, after witnessing our demonstration of the process in his presence, that he at once adopted it, both for his patients and for his own personal preserva-

tion against the inroads of disease, and has continued its employment till the present time, without a single day's sickness as the result.

But now we come to the new and important fact in this history on which hangs a most significant tale. So impressed was Dr. Stevens with the startling novelty and value of our discovery that he at once prepared a paper on the subject and read it before the medical society of that city, in the presence of many of the most prominent M. D.'s of that section of the State. The result was, as naturally to be expected, that considerable discussion took place, one leading doctor present denying its practicability and denouncing any man as "a d—d fool who would thus treat himself to cure disease."

We quote these exact words, as repeated to us by Dr. Stevens, to show the reader that at the time named the treatment was new to the medical profession, and so new that it was regarded as an innovation to be repudiated and condemned even before trial, notwithstanding Dr. Stevens, in the paper referred to, assured the learned members of the society that the discoverer of the treatment had cured himself of consumption by that same process twenty years before, and had practiced it upon himself at least twice to three times a week ever since, and with perfect success to the building up of his shattered constitution.

It is here proper to state that at the time of disclosing our physiological discoveries to Dr. Stevens, we saw no definite way of turning the new treatment to any financial account, however much we might need the money or deserve the reward for our discovery. Hence we placed no restrictions upon the doctor in making it known to others, merely notifying him that in the course of time we intended to publish a book on the discovery, or as soon as we should sufficiently demonstrate its intrinsic value to health and longevity by its long-continued use in our own case.

Thus the doctor naturally felt at liberty to make known the valuable discovery to his professional brethren, and did so in his lecture.

Although the assembled medical wisdom of Syracuse at that time gave the discovery the cold shoulder,—somewhat deterring Dr. Stevens from further public attempt to give it a start,—the lecture itself was not without its fruits. One doctor who happened to be present naturally told another, he another, and so on till the thing began to be talked about among advanced thinkers in medical circles.

At last the treatment itself in its practical application, almost up to our own standard, found its way into a certain sanitarium in the interior of this State, where it has been regularly practiced for years with such benefit to its patients, as to mark out that particular health-resort as one of the best in the country.

From this centre it has gradually found its way into one or two other sanitariums, and naturally enough has been picked up by a few enterprising physicians, notably, one in Philadelphia, one in Chicago, and a few others in Ohio, Indiana and other sections of the country of whom we have recently learned.

These isolated cases, into whose hands the revolutionary treatment has chanced to fall, are not at all blamable for adopting it, even without giving us due credit, since in fact they may not really have known the actual source from which they had derived the discovery. It was hinted and talked about from one to an-

\* This article embraces substantially the narration of facts as set forth and argued in one of the chapters of our large volume on the "Art and Philosophy of Great Longevity," which has been, at least, temporarily superseded by the printing of our condensed pamphlet.

EDITOR.

other, after the public lecture of Dr. Stevens referred to, until some who got hold of the plain knowledge of the discovery, did not really know that the whole thing originated with an obscure and desperate consumptive in Belmont county, Ohio, about the commencement of 1849, —some twenty or more years before its first public announcement in Syracuse.

All right; but now comes the provoking circumstance connected with this state of things, namely, that a reader of our pamphlet chances to have known that at a certain sanitarium in this state, some fifteen or more years ago, our very system of treatment was substantially practiced under the direction of the doctor in charge of that institution; and this unfriendly owner of our pamphlet jumps at the conclusion, and so asserts in a letter, that so far from the revelation in our pamphlet being new, *we must have stolen it from the sanitarium referred to!*

This conceited and illogical enemy could not grasp the fact that the chance appropriation of our treatment, even innocently, by such doctor, in no way interfered with our moral and just right to the discovery, which took place not less than twenty-five years before that doctor knew of it.

We have numerous witnesses now living who will testify that we discovered the treatment about the commencement of 1849 as stated in our pamphlet, and that we practiced it upon ourselves continuously from that time on until its first public announcement by Dr. Stevens, as just stated, more than twenty years ago, and in which he nobly gave us the honor of its first discovery. But all these facts count for nothing to a man jealously intent upon disparaging in others the just credit which he enviously desires to possess, but to which he knows he has no right.

Such a man, chancing to learn of the *phonograph*, would brazenly claim that he had a perfect right to the invention because he had made one of the instruments and used it! It would have no weight with such a peculiar mental composition to give him the proof from documentary evidence that Mr. Edison had invented it a dozen years before!

But another fact. For a long time previous to having become acquainted with Dr. Stevens, we were in the habit of making known our discovery to personal friends who happened to be in need of it. One of these chanced to be a personal and intimate friend of the late distinguished Dr. Parker of this city, —confessedly the most eminent medical practitioner in the United States. Our friend made known the system of treatment to Dr. Parker, to his great surprise and gratification, who assured him that if our claimed discovery were true and practicable, it would no doubt be of the greatest benefit to therapeutical science and to suffering humanity. The doctor at once sent for us to come and see him on the subject; but being on the eve of starting west on a long absence, and not being ready at that early date to bring out the discovery, we neglected this interview. Since then both the doctor and our mutual friend have passed away. All the foregoing we are ready to verify, if required, under solemn oath.

The moral of this fact is, that what that greatest living physician had never before heard of in medical science, was at that time a new and original discovery with us.

And although several doctors who have pur-

chased our pamphlet in different states have written us that they had for several years known of the treatment and had been using it, at least to a partial degree in their practice in place of drug-medication, and that, too, with the most successful results in relieving the sufferings of their patients, yet, to the honor of the noble profession be it said, that, with a single exception, none of these practicing physicians, after seeing the evidence of priority as set forth in our pamphlet and in the various articles of the MICROCOSM, but admit like honorable men that the treatment originated with us, and that during the first twenty years of our practical application of it, in building up our own broken-down constitution, no such practice or treatment, as elaborated in our pamphlet, was known or even suspected to be possible by the medical profession of this or any other country.

Last winter, as recorded in our Personal Statement (April No.), Dr. Stevens wrote to Dr. Jesse Huestis, of Columbus, Ohio, and by our permission, unfolded this discovery to him for the benefit of an afflicted relative. Dr. Huestis, one of the best read medical students in that state, received the treatment as entirely new to therapeutical science, not of course having heard of its isolated appropriation by a few sanitariums, and as stumbled upon by a few practicing physicians. In that disclosure by Dr. Stevens he stated that we made the revelation to him and demonstrated its practicability more than twenty years before, thus antedating the practice in any sanitarium or by any individual doctor by several years.

This fact, aside from the provable fact of more than forty years of the practice of the treatment in our own individual person, ought to have been sufficient to stop the mouths of gainsayers who may chance to have heard of the same treatment in isolated cases long since Dr. Stevens' lecture was publicly delivered.

Several months before Dr. Stevens divulged the treatment to Dr. Huestis, he wrote a letter to a friend in New York, a part of which was quoted in the December MICROCOSM. To show the conclusive proof as to the date of our making known this discovery to Dr. Stevens, we here reproduce the extract from that letter:

Syracuse, N. Y.

\* \* \* "Nearly twenty years ago in this city Dr. A. Wilford Hall gave me privately a detailed history of a hygienic treatment he had discovered and adopted some twenty years before, and which he had practiced continuously upon himself up to that time. This history included an account of the failure of his health, the reasonings and conclusions which led him to adopt the treatment, his rapid restoration to health, etc. From the time of his first mention of it to me I have been entirely satisfied that it saved him from a lingering consumption and death; and that in the years following, as I have evidence to satisfy me, its continued practice has so affected the nutrient and eliminating functions as to give to his physical structure a greater degree of solidity, or in other words, a higher specific gravity than that possessed by any other man living. I learn that he has persistently continued the treatment to the present time—forty years in all—and that his present health and vigorous condition may rightfully be compared to the 'bloom of youth,' though he is nearly seventy years of age. The tests I have made of the treatment upon myself and in my practice in



the twenty years past, have convinced me that great practical benefit may be derived by members of the medical profession and others from a careful study of the rationale of the treatment as discovered by Dr. Hall, the details of which he proposes to give in his forthcoming book. A debt of gratitude will surely be due him for whatever scientific advances he may be able to unfold in the line of assisting nature to ward off disease and in the restoration of health.

R. F. STEVENS, M. D."

Let no one, with this positive statement on record, prove himself so shallow and bigoted as to refer to the recent practice of our treatment at a given sanitarium or by a few private physicians who have incidentally been made aware of it, as a disparagement of our original and demonstrated right to the discovery. Decent respect for logic should make such a would-be robber search for proof at least twenty years old, and even then stop to ask if twenty years more should not be added under all the circumstances, before trying to infringe our moral and just rights to the discovery.

We mention no names in this connection, as we do not wish to do a personal harm even to an enemy whose envious grudge because of the success of a friend could instigate an uncalled-for animosity.

One advantage, however, results to us and to our just cause in this attempted disparagement, and that is the fact of the acknowledged great value of the treatment itself,—so important in the cure of disease and the perpetuation of health, that the enterprising managers of sanitariums as well as unbiased practicing physicians, disgusted with so much drug-medication, are seizing upon this revolutionary treatment as they chance to learn of it and putting it into practice without even stopping to inquire as to its origin. We bide our time for justice, since the facts as well as the date of the discovery are already placed authentically before tens of thousands who are now reading our pamphlet and enjoying the benefits of the treatment.

We will only add, that with all the appropriation of our discovery in the sanitariums and by the private doctors in their practice here referred to, the great feature of our pamphlet (pp. 25 to 30) for the cure of every form of kidney trouble, has been left unappropriated and untouched, simply because it happened to be unrefereed to in the paper read by Dr. Stevens. This very suggestive fact speaks for itself.

#### PRIZE ESSAY, No. 16.

"Man is a Microcosm—An Epitome of the Universe."

BY MRS. M. S. ORGAN, M. D.

This aphorism, penned many decades ago, has been accepted by the scientific world as a summary of philosophical and scientific truth. But it must have been described through the prophetic prevision of soul; for until Substantialism was projected upon the world of mind, no scientific data had been furnished, through which such a sublime philosophical truth could be evolved.

This prophetic discovery of a scientific truth, is but one of the many demonstrations of the power of the intuitive or spiritual element of soul, to anticipate intellectual perception, or

the discernment of truth through reflection, comparison and experiment.

By logic, by analogy, by the immutable laws of philosophy and mathematics, Substantialism has demonstrated that the immaterial but substantial force in the physical, vital, mental and moral world is the *Real*;—that material substance is but its phenomenal manifestation;—that in its ultimatum, it is relegated to the domain of the invisible and immaterial.

Matter is thus but the visible expression of different combinations of immaterial force; and upon the aggregation and arrangement of the various forms of immaterial force depend the size, form and quality of material organization.

Even with our limited power of chemical analysis, all matter, organic and inorganic, can be resolved back to the intangible and invisible. The physical and primordial forces of the universe are subjected by the vital—and higher—force of the vegetable world, and through its alchemy are transmuted and ennobled, and become active, living form and force.

The vital force of vegetable life, is in turn subordinated by the higher mental force of the universe;—transformed into still superior structural arrangement, and impressed with the laws of animate life. And so on, in a regular concatenation of change, until the culmination is reached in man; in whose individuality, through spirit-force, are absorbed, conserved, transfigured, spiritualized, all the forces of the universe, from the physical up to the vital and mental.

Thus, true science clearly demonstrates, that through the conservation and embodiment of all the force-elements of nature, man becomes a "microcosm—an epitome of the universe."

All this graduated series of unfoldment—this progressive change, is not through any inherent power in matter, or in the physical forces; for with all their diversified forms of action, with all their stupendous power, with all their subtle, penetrating strength, they can not pass one jot or tittle beyond the confines of the inorganic world. Without the super-added force of vitality to hold these forces in abeyance, to control, direct and transform them into living power, the vast universe would have continued to roll on its ceaseless aeons—unsightly, barren and desolate. Without the mental force—superadded to the vital—transforming and assimilating vitalized forms of matter, the earth with all its garniture of forest and shrub, of verdure and flower would have remained forever devoid of all volitional and sentient life. And without the all-controlling power of spirit—the regnant force of the universe—supplementing the mental, no soul of moral attribute and reflective intelligence would ever have breathed the breath of life.

While there is harmony in the universe,—paradoxical as it may seem—there is also antagonism;—antagonism between the forces of the physical, vital, mental and spiritual world. There is no correlation of force—which induces a tame submission or voluntary yielding. Individualism is the law impressed upon every force, in every realm of nature, and this constitutional freedom only submits, when overpowered by superior force.

The physical, vital, mental and spiritual kingdoms are related only, in that, the superior force can subordinate and use the lower in a process of transmutation and assimila-

tion, and then, upon this transfigured structural arrangement, stamp its own image and superscription.

Thus with definite and indisputable scientific data, does Substantialism demonstrate that "man is a microcosm—an epitome of the universe."

But by what process of logic or philosophy known to the mind of man, can such a conclusion be reached from the premises laid down by the so-called popular science of to-day,—its fundamental principle being, that all force is but a mode of motion,—motion of the atoms composing matter, or of an all pervading ether, or of both combined? *If motion be force*, then it follows as an inevitable sequence that it must produce itself; and thus be both cause and effect,—a proposition both logically absurd, and mathematically false. Analyzed in the crucible of philosophy, motion is demonstrated to be but the mere position of a thing in space changing; and this change of position can only be effected by the action of an extrinsic force, and which must necessarily be substantial in order to produce a physical result.

Motion being but position in space changing, is essentially a non-entity. Can a mere negation be correlated to any force or thing? To ask this question, is,—to a scientific mind,—to answer it.

There is, there can be no basis for the correlation and conservation of force, unless it be a positive entity—a substantial something to be correlated and conserved. Only as a real substance, can force be related, conserved and transmuted into different forms, and impressed with a new order of laws and properties.

New York City.

**The Absurdity of Supposing that the Conditions of the Universe are Everywhere the Same Throughout Space.**

BY JOHN C. DUVAL.

If one will only reflect that space is limitless—absolutely without bounds—the absurdity of supposing that the conditions of the whole (if such a term can be applied to what has no limits) are everywhere the same, will at once become apparent. What is the greatest extent of space of which the mind can form any conception, when compared with that which has no end? And yet we complacently prate about the conditions of the *universe*, just as though the finite portion that comes within the scope of our observation bore some proportion to what is unseen and endless. For instance take the force we call gravity. We know that it diminishes between material bodies in a certain ratio to the *distance* intervening, and therefore there must be a distance where it ceases to act altogether. Now let us suppose (and why may we not since space is endless) that vacancies occur in it, unoccupied by material bodies, so great, that gravity can have no effect upon worlds beyond them. Why may not a different order of things altogether prevail in those remote regions, whether this order be attributed to the "all potency of matter" or to an omnipotent ruler? Surely the power (whatever it be) that could institute such a condition of things as we see within a finite portion of the universe is not compelled to act invariably in the same way. Such a power (call it by what name you please)

in *infinite space*, must have many ways of manifesting itself. It can not be restricted to one routine of action. On the contrary, in *infinite* isn't it reasonable to suppose that its action will be *infinitely* varied? Who can say that vast portions of this infinite space may not be absolute voids, without a sun or a world and beyond the orbit of the most eccentric and far-traveling comet-regions so vast that not even gravity nor that "all pervading luminiferous ether" can penetrate them; and why beyond such voids may there not be worlds and other laws in force very different from those prevailing here? In those regions worlds might be stationary or quiescent, instead of revolving about each other through the action of forces of which we know nothing, and the beings that inhabit them might be immortal because the laws governing matter there might be of such a character that decay and dissolution would be impossible. Why not? Even on this earth, where there are so many antagonistic forces to contend against, we see that vitality often "holds its own," for more than a hundred years in the animal, and for a thousand in the vegetable kingdom.

We can not grasp the idea of the infinite by comparing it with anything finite, no matter how enormously great the latter may be. Millions, billions, quadrillions of miles are no more in comparison with endless space than the smallest conceivable fraction of an inch. Deduct either the one or the other from endless space, and endless space still remains.

If an inhabitant of some other world who was utterly ignorant of the existence of our globe, were given a single grain of sand from our sea shores, and was required from that small particle to pronounce its conditions, and to describe the oceans, continents, mountains, lakes and rivers that diversify its surface, he could do so just as easily as we can pronounce upon the conditions of the universe from what we see within the limited scope of our observation; and yet the grain of sand would be infinitely larger in comparison with the earth, than any finite distance (no matter how great) when compared with endless space.

It seems to me, that an *imperfect* knowledge of what prevails in a *finite* portion of space, gives us but meagre if any data to pronounce upon the conditions of a universe that has no bounds.

**VOL. II., SCIENTIFIC ARENA.**

This volume, which rounds out the various discussions of the Substantial Philosophy up to date, will go to the bindery at once, and be ready to mail during the present month.

Most of our readers know that through the unfortunate failure of Elmendorf & Co., publishers of the *Arena*, this second volume was not completed, though it contains many of the finest discussions and set papers on the subject of Substantialism, including a large number of our own leading editorials.

About 250 of our subscribers have already notified us by postal card that they desire this volume to complete their Library of Substantialism. We print 1000 copies, so as to be able to supply all who may order it, and can print more as needed. Send \$1 and the volume will be sent post paid. Address the Editor.

## A SAMPLE OF KIND WORDS.

[Out of numerous kind letters reaching this office continuously, we make room for only two as a sample of hundreds. Should any reader feel disposed to accuse us of vanity in thus printing favorable opinions of our work, he is at liberty to enjoy that sentiment if it will do him any good.—Editor.]

WHAT A PROMINENT SOUTHERN BAPTIST MINISTER THINKS.

Switzerland, Fla., Aug., 1889.

"A. Wilford Hall, Dear Doctor,—\*\*\* I am more or less familiar with your writings, especially with the 'Problem of Human Life.' I have never been an evolutionist; but I am not wiser than other men, and although I saw the evil tendency of those writings, my apprehension was that my objections were not well founded. When, therefore, the 'Problem of Human Life' fell into my hands, its reasoning delighted me. Your views—a thousand times better expressed than I could have presented them—were almost in precise accord with my own. I bowed down and thanked God and A. Wilford Hall that my hopes as a humble Christian were not to be yielded up to the unfounded assumptions and sophistries of Darwin, Huxley, Hæckel, etc. God bless and reward you for that work. I am now in my 78th year. Since 1835 I have been engaged in the work of the ministry, and the good Lord has blessed my labors abundantly. During this time I have baptized about 2,300 into the fellowship of the Baptist Church, while I have witnessed the professed conversion of as many more under my ministrations. Many of these have entered into the rest which the Saviour has prepared for his people, while many are now members of good evangelical churches. Although I am a decided Baptist, I am not a sectarian, and rejoice in the results of my labors as evidences of the grace and goodness of God. \*\*\* Something over two years ago I experienced a partial paralytic stroke, and was led to conclude that my life-work was done. Since my residence on the banks of the Johns River my strength is in a measure restored so that I am enabled to preach every Sunday to the destitute around me. It is a weakness in an old man to cling to life; but there is an apprehension which haunts me: It is the possibility that I may sink into the imbecility of old age, and thus become a burden to friends. If your new treatment is such as to give reasonable grounds of exemption from this fear, I shall be very grateful. I am already grateful for the 'Problem of Human Life,' and a health-treatment that would accomplish the result named would greatly add to my debt of gratitude. If you can negotiate a check on Jacksonville I will send for the pamphlet. \*\*\* Yours very truly, H. Talbird."

[Dr. Swander has sent us many letters received by him from those who have ordered his book. They all breathe the same spirit. Here is one as a sample of more than a dozen]:

"Manly, Iowa, August 5th, 1889.

"J. I. Swander, D. D., Fremont, Ohio; Dear Bro.—I desire to show my appreciation of Dr. Hall's work in founding Substantalism. Also to express my high regard for your papers that have appeared in the *Microcosm* and *Scientific Arena* by purchasing your book entitled the 'Substantial Philosophy.' I regard Substantalism the mightiest weapon, apart from the Bible, ever put into the hands of the Christian ministry for the pulling down of the strongholds of skepticism, and I look upon Dr. Hall as the greatest benefactor of this age.

Inclosed you will please find \$1.50 (postal note) for a copy of your book. Respectfully, (Rev.) S. A. Walton."

## THE BROWN-SEQUARD ELIXIR FIASCO.

BY THE EDITOR.

Like a cyclone the Brown-Sequard Life Elixir craze has been sweeping over the country during the past few weeks, till not a city of any respectable size in the United States but has been thrown into a furor of excitement by the precipitate experiments of some prominent physician, going to demonstrate the rejuvenating effects of the wonderful discovery.

Cripples were said, in the newspaper reports, to have thrown aside their crutches and to leap for joy, while old and decrepit men were reported to have arisen from the experimentations and commenced dancing jigs and break-dances.

Most of these reports, suffice it to say, have

proved to be pure fiction, evolved from the imagination of the versatile newspaper reporter's brain, while the slight tinge of truth contained therein resulted, not from the pure lamb or guinea-pig extract hypodermically injected, but from the addition of morphine, cantharides, or other exhilarating ingredients mixed therewith.

But as it is well known that all such artificial excitation invariably causes the patient to sink as much below his normal condition after it wears off, as the exhilarant has raised him above, it was only to be expected, just as it has resulted, that the deception would immediately run its course and expose itself.

What was remarkable, however, in regard to the thousands who were reported in the papers as having been rejuvenated by the Brown-Sequard Elixir, not a single testimonial was produced from man or woman, with post-office address for verification, where any sort of improvement in health or youthful vigor had been effected by that miss-named Elixir. Contrast this fact with the scores of personal testimonials printed in the *MICROCOSM* from month to month, in favor of our own health-treatment voluntarily furnished from Doctors, Ministers, Lawyers and other citizens of repute, with their post-office addresses affixed, testifying to permanently restored health, and a surprising increase of youthful vigor and elasticity, all, too, without drugs of any kind, and without a single newspaper report to bolster up the new remedy.

In the August *MICROCOSM*, page 137, we referred to the Brown-Sequard Elixir, and in advance of all other adverse medical or scientific reports condemning the hypodermic injections, we denounced the claimed discovery of the distinguished French-American scientist, as not only preposterous, but absolutely dangerous to life and health. Now, after more than two months since those paragraphs were written, we have the pleasure of copying from the eminent Dr. Geo. F. Schrady of this city, as printed in the *Medical Record*, substantially a reproduction of our own denouncement of the pretended "Elixir." Here is what Dr. Schrady says:

"The method is on its face preposterous, its vaunted effects are impossible and ridiculous. It is opposed to all known physiological and biological laws, and had it not been bolstered up by the reputation of a Brown-Sequard it would scarcely have been heard of outside of the Paris society where it was proposed, and no one would ever have looked upon it in any other light than as the foolish conceit of an old man in whose mind the dreams of returning youth had assumed the counterfeit of reality.

"Supported as it was, however, by the weight of an authority hitherto respected in the world of medicine, it was necessary that it should be tested cautiously and in the proper way, and that the theory should not be actually condemned until it had been proved extravagant as its pretensions were worthless. For unreflecting and obstinate scepticism in matters medical is as illogical as unreasoning credulity.

"The experiments reported by Dr. Loomis are sufficient, we think, to satisfy the demands of legitimate prudence. In fact, it has already received more attention than it has deserved. The results of these experiments seem to show that the injected material may, in certain cases, act as a mechanical stimulant, but that is all; they fall utterly to support the extravagant claims of physical and mental rejuvenescence which have been put forward in behalf of this method.

"What these experiments do not so clearly show, since they were conducted with a proper regard for surgical cleanliness, is the imminent risk of septic poisoning or of tuberculous infection to which the subjects of such injections are exposed in the hands of incautious operators."

This is a most sensible and logical view of the whole case, and we call attention especially



to the sentence we have italicised at the close of the middle paragraph, as expressing the true motto for all correct scientific investigations.

As to the question of physical and vital rejuvenescence, we repeat, as stated in the August article referred to, and emphasize it here for the benefit of Dr. Schrady and all such logical thinkers in the medical profession, *that the only real "elixir of life" consists in some sure method of purifying the vital circulation, and keeping the normal impurities of the organism out of its way, thus to allow the eliminating processes of the body, to cast off and excrete freely the organic tissues, as they wear out and decay, and at the same time to permit the assimilating function to replace such worn-out tissues with pure nutrient substance uncontaminated by impurities unnecessarily picked up from the blood, while in transit from the Alimentary Canal.*

This is the true vital elixir which is needed to insure increased longevity, and it involves the only practical process of rejuvenescence by which nature is to be assisted in promoting uninterrupted good health, and in staving off senility or premature old age. And this is the process, as fully set forth and elaborated in our health-treatment, to which we earnestly call the attention of such independent medical thinkers and investigators as Dr. Schrady.

#### DOCTOR HALL'S CRUELTY.

BY THOMAS MUNNELL.

The fierce, clashing battle that had been raging between Dr. Hall and the wave-theorists for years had come to a lull. The iconoclast of certain scientific idols seemed to have finished his work. The multitude of facts he had hurled against conclusions of 2500 years standing had discouraged their advocates. They had always assumed that external sound and air-waves were identical, and that sounding bodies moving many times more slowly than the hour hand of a clock, did actually produce "condensations and rarefactions" of the air, so powerful as to create waves of air that were the same thing as sound—no more and no less than sound.

But, like a recently defeated pugilist in explaining the cause of his failure, wired to his friends simply that "nature gave out," so for nearly two years past the said theorists have by silence been saying that nature had given out under the resistless blows of their nervy antagonist. All was quiet until Edison brought out his marvelous phonograph with its curious indentations on its cylinder foil. It wasn't long till that hope which "springs eternal in the human breast" began to wake up the wave-theorists with a new idea. Now, at last, they had an argument that *would* down the sturdy doctor. This time there *could* be no failure. They felt sure that said indentations were caused by the air-waves set in motion by the human voice, never dreaming that this was also an *assumption* just as baseless as the old assumption that the air-waves produced all sounds. In utter unconsciousness of the facility with which Dr. Hall would at his leisure hustle that new assumption out of doors, they have rested in peace and in fatal security till the August number of the MICROCOSM, 1899.

How cruel it was then in the editor to wait until they had well done their glorying over his supposed defeat, and then in a single arti-

cle to toss their argument like a feather; for he has not only shown that in principle this assumption is the same as the previously exploded one, but has withdrawn certain concessions formerly granted to that theory, and above all has demonstrated by scientific facts that sound is produced where there is no possibility of air-waves whatever. Whoever wishes to see how all this is accomplished and to see his handling of the whole phonograph argument had better read the editorial in the August MICROCOSM.

To show that air-waves have nothing to do with the impressions made upon the aforesaid foil, the doctor says: "A soundless vibrating instrument should produce the same sympathetic action on an adjacent stretched diaphragm as one that sounds never so loudly, especially if the two instruments produce equal action on the air. Yet it is a naked and patent fact that one kind of sounding instrument with large and powerful vibrations can scarcely be heard at all, while another with manifold less action on the air is known to generate a sound almost deafening." This he illustrates by samples of the two kinds of instruments named, proving beyond question that not air-waves but sound-waves produce the indentations spoken of. But as high-license is the "last ditch" of saloonists and saloon politicians, so is this phonograph and telephone argument the last ditch to the advocates of wave-theories whether of sound, light, heat, or of any other natural force.

It still remains after everything is said for and against *Substantialism* that it contains the only reply to the materialism of Hæckel and others; and it also remains that none of its opponents have undertaken to show us how to answer Hæckel without the use of the Substantial Philosophy, though often urged to do so.

It is also most surprising that Christian men and even Christian professors should cherish an unquenchable hostility to a philosophy that has announced the best argument ever produced from science and philosophy, combined for the immortality of man. But truth can afford to wait a generation as usual for the tardy growth of the human mind.

#### SPECIAL OFFER TO MINISTERS.

We have so much faith in the intrinsic merits of our Health-Pamphlet and the treatment unfolded therein, that we now propose to any *clergyman* who will order it at the regular price (\$4), and who will give the treatment a faithful test for one month, that if not satisfactory he shall have the privilege of returning the pamphlet and receiving his \$4 by return mail, without any reduction for our trouble and expense. This surely ought to satisfy the most skeptical and wavering.

But it is understood, that such ministers must not only agree when ordering the pamphlet not to show it or reveal its contents outside of his own family, but must, if he returns it, send a like written promise never afterward to use the treatment or permit it to be used by his family.

Let no one hereafter say that we wish to obtain money from the purchasers of this pamphlet without giving full value for the same.

Respectfully, A. WILFORD HALL,  
23 Park Row, New York.

Our Health-Pamphlet is still winning golden opinions from all classes, as the following two pages of additional volunteer testimonials prove:

Dr. F. D. Bittinger, Dayton, Ohio, writes:

"A. Wilford Hall, My Dear Doctor,—My experience with your treatment has removed all the doubt that I may have had concerning its applicability to all classes of people, and to all diseases where enough vitality is left to build from. Its merit I never doubted since first acquainting myself with your process as set forth in your Health-Pamphlet. Recently induced another M. D., suffering from consumption, to send to you for your pamphlet. He writes me that he has done so, and his last letter already reports improvement. Your discovery is what every doctor needs in his practice, and if the medical fraternity would lay aside their prejudice and adopt your treatment they would find their success in treating the usual diseases greatly increased. The price of the pamphlet is less than a bagatelle in comparison, and should not be considered for one moment by a medical practitioner. Families will save many severe cases of sickness if treated upon the principles set forth in your pamphlet. Your reward is sure, and will be very great, for having given to the world this grand discovery."

"Your grateful friend, F. D. Bittinger, M. D."

[Contrast this manly statement of Dr. Bittinger with the vulgar caricature of the pamphlet by a certain "M. D." in a certain recent medical journal, and note the difference in their moral complexion. The verdict of Prof. A. Pflueger, of the Capital University, Columbus, Ohio, on that low blackguardism, will meet a response by every decent reader of the journal referred to. He says, in a letter just received: "The vulgarity of the man is enough to ostracize him from decent society, but his lies are still more contemptible."]

M. Crim, M. D., Englewood, Ill., writes

"Dear Dr. Hall,—I give it as my deliberate conviction that more persons have died from the effects of drug-medication than have ever been kept alive by its use. And I am equally free to state that I hail the day as not far distant when your new treatment will have superseded drug-medication entirely, and when that dreaded disease—pulmonary consumption—will be a thing of the past. There is no amount of money that would purchase my right to the use of your treatment personally and in my practice. To me it has become as a priceless jewel. But I must not tax your time further. Remaining your faithful friend, M. Crim."

A third indorsement from Dr. J. M. Peebles (M. D.), Hammononton, N. J., who writes:

"My Dear Dr. Hall,—I hope and pray that your strength is up to high-water mark these August days to enable you to push your discovery. I am still using it personally, and have perfect faith in it as a healing, renovating, health-producing panacea. \* \* \* Blessings upon you! I am receiving a full dozen letters a week from all parts of the country asking if my signature in the July and August Microcosm is genuine? I take pleasure in replying in every case "Yes," with a capital Y. Most cordially yours, J. M. Peebles, M. D."

M. F. Losey, M. D., San Francisco, Cal., writes:

"Dear Dr. Hall,—After having used your treatment as set forth in your Health-Pamphlet, I want to say to you that I am very much pleased with it. I have used it two weeks. My patients to whom I have recommended the pamphlet report improvement in their health, and are well pleased with the effects of the treatment. Inclosed please find Money Order for five more pamphlets, which send immediately."

"Yours truly, M. F. Losey, M. D."

Edward J. Morrison, M. D., Gun City, Mo., sends his third emphatic indorsement of our pamphlet as follows:

"Last Saturday I sent to you for three pamphlets, in which I told you of the marked improvement of Mrs. Liston, one of my patients under your treatment. Now I enclose check for five more copies of your invaluable little work. Mrs. Liston is still improving, though she had constantly grown worse for two years under the usual medical treatment, and became so dangerously ill previous to trying your discovery, that two consultations were held over her case. \* \* \* From the very first application of your treatment she obtained relief, and to-day she is better than she has been for two years, and is now out visiting among friends, as a living demonstration of the value of your inestimable remedy."

The discovery is creating a sensation in our town. My own health is rapidly improving under the treatment, and I have gained six pounds in weight and a hundred pounds in intellectual comfort since I commenced using it. I am writing to many of my personal friends, whom I feel sure your treatment will restore to health. With much esteem for you personally, and grateful for your wonderful health-discovery,

"I am, sincerely yours, Edward J. Morrison."

Dr. R. B. Dando, Alta, Iowa, writes:

"I am doing an excellent work here in placing your admirable Health-Pamphlet into the hands of my patients. The new treatment without medicine is giving the best of satisfaction wherever it is properly used. The man of whom I spoke in my last letter, as having been given up by the doctors to die, is rapidly getting better under your treatment. Inclosed find check for five more pamphlets, which please mail me at once."

"Yours truly, R. B. Dando, M. D."

Dr. D. Neuenschwaunder, of Belvidere, Tenn., writes to Robert Craig, of Lebanon, Tenn., inquiring if his indorsement of the Health-Pamphlet in the July MICROCOSM was genuine. Mr. Craig replied, and Dr. N. incloses his reply with \$4 for the pamphlet. Among other things Mr. Craig writes:

"I would not take \$5,000 for the knowledge of Dr. Hall's discovery. I expect to use this no-medicine treatment for life, and thus save myself from Bright's disease. The blind, swimming of my head (vertigo) has ceased since adopting this treatment, and my bowel trouble, as well as that of my son and brother, is a thing of the past. I believe it is the only 'Life-Insurance Co.' for even healthy people to take stock in. Thank God for having given to the world A. Wilford Hall. Yours, etc., Robert Craig."

Rev. C. E. McReynolds, of Seattle, Wash. Ter. (No. 912 Pine st.), writes:

"Inclosed please find check for another copy of your Health-Pamphlet for Mr. H. H. Pease. I shall try to make known your invaluable treatment to the afflicted of this recently scourged city, to which I have but lately moved. I am now using your remedy with the best of results upon myself. Indeed, it is worth more to my health than all the medicines of which I have any knowledge. You are at liberty to use this testimonial, as it might influence some of my friends to procure a treatment so important to their health. \* \* \*

"Yours truly, C. E. McReynolds."

Dr. W. J. Stafford, of Danville, Ark., writes:

"Dear Dr. Hall,—I have tested your treatment with admirable effect during the short time since I received your pamphlet. In my own case it has wrought wonders, and I am amazed at the result. I have been suffering from the rheumatism for five years, having first had a severe attack of pneumonia and been salivated in treatment. Up to the time of receiving your pamphlet I was sore all over, so that I could not stir my limbs or even my jaws without pain. But after the third application of your treatment all pain and soreness left me. I am delighted with the effects of your common-sense remedy. The people here are watching its effects on me, and you will no doubt hear from them before long, though they are very incredulous about anything new."

"Yours very truly, W. J. Stafford, M. D."

Dr. C. H. Kermott, La Moure, Dakota, writes:

"Dr. A. Wilford Hall, Dear Sir,—I was called to attend our Sheriff, and I prescribed the usual remedy for his ailment. He was improved for a time, but then became worse. On the 20th I received your pamphlet, and after reading it carefully, I applied the treatment to the patient at eleven A. M. on the 21st, and at one o'clock the inflammation and swelling were all gone; and to-day, the 22d, he is attending to the duties of his office, without even a staff to lean upon."

"Yours very truly, C. H. Kermott, M. D."

C. N. Udell, M. D., of Blakesburg, Iowa, one of the leading physicians and surgeons of that State, writes:

"Dear Dr. Hall,—Your Health-Treatment is a grand success. I am already completely cured of my prejudice, and much benefited physically by the personal application of your remedy. I am also using the treatment satisfactorily in my practice."

"Yours truly, C. N. Udell, M. D."

[Dr. Udell was so suspicious, when sending for the pamphlet, lest it was some trivial, catch-penny affair, that he accompanied his \$4 with a peremptory condition that if it was any humbug calisthenic operation (naming half a dozen claimed health-movements), we

must not send it, but return the check. We hesitated two days before deciding to keep the check and send the pamphlet, but finally determined on doing so, with the result as given above in the doctor's own words.]

H. F. Hawkins, Esq., a prominent attorney-at-law, of New Madrid, Mo., writes:

"Dr. Hall, My Dear Sir,—I have waited to give your treatment a thorough test before expressing an opinion concerning it. I have now been trying it for two months, and feel prepared to report judicially upon its merits. Scientifically, your theory of treating disease and promoting health admits of no dispute, while practically it is the simplest, safest, and cheapest of all remedies. Indeed, I am satisfied that all methods of treating disease, based on the use of drugs, are failures in comparison with it. While it can positively injure no one whatever the nature of the disease, it accomplishes what no medicine can effect, by removing diseased conditions without leaving the organization the worse for the treatment. The results from its use in my own case are greatly beyond my expectations, even after I had read your excellent pamphlet and approved your system of treatment. I have been an intense sufferer for sixteen years with nervous headache, neuralgia and dyspepsia. But for the last six weeks I have not felt a symptom of pain of any kind. I can now eat what I please without fear of dyspepsia, and have gained nine pounds of flesh within that time. I do not get tired as formerly, though doing much more work. I recommend your treatment to everybody, and thank you for it. Truly yours, H. F. Hawkins."

Rev. J. McFarland, St. Thomas, Dakota, writes:

"Dr. A. Wilford Hall,— \* \* \* Send me three pamphlets at once for friends, for which I inclose check. I have used your treatment but four times, and I am fully persuaded that it will entirely cure my heart-disease. \* \* \* I am, yours truly, J. McFarland, Baptist Missionary for North Dakota."

Rev. R. H. Byers, Houston, Texas, writes:

"I have been using your treatment for a week, and have already received most marvelous benefit from it. It is not necessary to give particulars, though I can say I am completely relieved of ———, a trouble of over thirty years standing, and I am certain that with your remedy I can remain free from it as long as I live. I know several men who would gladly pay \$1,000 to be cured of the same trouble, and I feel sure your remedy will do it. No amount of money would be a temptation for me to give it up, or be debarrd from the knowledge I have received from your Health-Pamphlet. I regard the \$4 I sent you as but the dust in the balance. Your grateful friend, R. H. Byers."

Robert Ramsay, Nottawa, Ont., writes:

"Dr. Hall,— \* \* \* I am glad to tell you that I have found by practical experience that all you have printed in favor of your wonderful health-discovery is true. My rheumatism and dyspepsia, which have troubled me for four years, have left me, and I not only am well, but can eat anything I choose with impunity. \* \* \* You are at liberty to use this as my testimony in favor of your treatment. Robert Ramsay."

Mrs. B. P. Sears, Bowling Green, O., writes:

"My husband considers your treatment a marvelous remedy for his kidney trouble, which has been his 'thorn in the flesh' for these many years. I also am greatly improving in health and strength by the use of your treatment. Respectfully yours, Mrs. B. P. Sears."

Eld. H. J. Brubaker, Maxwell, Iowa, writes:

"Dear Friend Dr. Hall,—My wife and I have been using your treatment now for six weeks and we both feel highly gratified at the result. Our old stiff joints are becoming more elastic and sensibly rejuvenated, and our internal organs are getting back to their normal condition. We now sleep sweetly and soundly, and I assure you we are so thankful for your discovery that we have no words in which to express our joy. I am doing all I can to let others know about the great value of your treatment by circulating the Microcosm. Some who read it, look upon the claims of the discovery as an idle tale; others cry 'humbug' and turn away with ridicule and sneers; while many stick up for drug medication. These Ephraims are joined to their idols, so we will have to let them alone till they become better informed. \* \* \* I remain your friend, H. J. Brubaker."

Eld. J. A. Lincoln, Davilla, Texas, writes:

"Dr. A. W. Hall, Dear Brother,— \* \* \* I received your Health-Pamphlet on the first day of last July, when I was prostrate in bed and had been for two months with a complication of ailments including those of the kidneys and bladder. In twelve days after beginning your treatment I was enabled to leave home and begin a series of meetings, and have preached from once to

twice a day ever since, and have actually gained *ten pounds in weight within the last thirty days*. I can now eat everything I want both in quantity and quality with entire impunity. I regard your remedy as not only a safe and simple cure for the sick without medicine of any kind, but equally a preventive of disease in the well. Your pamphlet ought to be extensively circulated and read, and you surely deserve a good remuneration for so valuable a discovery. I have been solicited to sell scores of different things, but have seen none that I could honestly recommend till this. There is no possibility of dishonesty or deception in selling your pamphlet at the price you have fixed, and hence I feel perfectly justified in working for it if you will give me your terms to agents. \* \* \* Truly yours, J. A. Lincoln."

W. T. Stewart, of San Jose, Cal., writes:

"Your treatment is working wonders with my family. My wife has had the dyspepsia for fifteen or twenty years, and the chronic dysentery for eighteen months; and after a few applications of your treatment, her dysentery has ceased, her appetite is good, the heavy feeling at the stomach all gone, and the piles which had greatly troubled her seem to be entirely cured. Other members of my family have also been greatly helped by using the treatment, and I can safely say 'good-by to my family doctor.' Yours truly, W. T. Stewart."

O. N. Bryan, Marshall Hall, Md., writes:

"I am so much improved by the continued use of your treatment, since my former indorsement, that I can not find language to express my gratitude for your grand discovery. I find plenty of persons afflicted like myself, but they are slow to believe. It will take time, but your discovery is sure to triumph in the end. Truly, Oliver N. Bryan."

Rev. M. Fernsler, of Schaffertown, Pa., after several more weeks of experience with the treatment, sends a second indorsement as follows:

"Dr. A. Wilford Hall,—Just to-day I have heard from my son-in-law, Mr. C. J. Link, of Lebanon, Pa., who has been using your treatment for some time, having been induced to try it by me. He says: 'For several years hardly a day has passed over my head that I did not suffer pain across my kidneys, sometimes so severe that when I stooped I could scarcely straighten up again; or if I walked a mile, it seemed as if my back would break. Now that is all gone. The tightness across my chest has left me, my head is clearer, I am rid of my tired feeling. The treatment is certainly something wonderful and it surprises me that a process so simple should produce such effect, but such is the case and there is no disputing the fact.' The above is his own language and speaks for itself. He at first thought the treatment, for which so much was claimed, must be an imposition because such a trifle as \$4 is charged for it. Now he is convinced to the contrary, and I fail to see how any honest man can feel or report otherwise after fairly testing it. Yours truly, M. Fernsler."

A. D. Laughlin, Scandia, Kan., writes:

"Dr. Hall,— \* \* \* There are now eight families using your treatment in and near this town. All of them are more than pleased with it. Two bad cases of flux were cured with it at once, and all who have used it are enthusiastic over it. My own progress toward health has been slow, but far more rapid than I ever expected at my age. From my first reading of the pamphlet I saw the reasonableness of the system and felt that I could recommend it to others even if it did me no good. But others waited to see its effect on me; and now I tell them to look at me and feel my pulse! \* \* \*

"Yours very truly, A. D. Laughlin."

Geo. B. Williams, Kingston, Mass., writes:

"I have received your Health-Pamphlet. It is a revelation surely, and must create a revolution in more senses than one. Take it as a whole I never read so clear and sensible a solution of the true cause of disease and its true remedy in my life. Strange that science has never given us this revelation before! When I made the first application of your treatment upon myself last night, I had the demonstration of its value before my eyes, and saw the first ray of hope I have had for years of improved health, etc. \* \* \* Truly, Geo. B. Williams."

Rev. S. C. Littlepage, D. D., Bastrop, Texas, writes:

"Dear Dr. Hall,— \* \* \* I do not think you have set forth anywhere near the real value and importance of your treatment. I believe it will cure cancer or any other disease, local or general, that has its seat in organic impurities. True, I have as yet taken but two applications of your remedy, but I am amazed at the result. You will hear from me fully after a little more experience with the treatment, as it has opened up to me a new field of physiological investigation."

"Substantially your friend and co-worker, S. C. Littlepage, Pastor M. E. C. South."



## THE LIBRARY OF SUBSTANTIALISM.

This library consists of eight volumes, all of which are devoted to the principles of the Substantial Philosophy. These volumes are:

1. The "Problem of Human Life," 524 double column octavo pages bound in cloth, price \$2, by mail. This was our first scientific book, of which between 60,000 and 70,000 copies have been sold without a dollar spent in advertising—simply by one person telling another. The discussions and original principles introduced and unfolded in that volume have led to seven other books, making up this library, as follows:

2. Five volumes of the *Microcosm*, of nearly 400 double-column octavo pages each, bound in cloth, price \$1.50 per volume, or \$7.50 for the set, by mail. These volumes contain the rise, progress and complete elaboration of Substantialism during its stormiest discussions, directly after the circulation of the "Problem" began, and are invaluable to those desiring to obtain a knowledge of that Philosophy in all its details.

3. The *Scientific Arena*, volume 1, a large quarto of nearly 200 pages bound in cloth, price \$1 by mail, is a continuance of the discussions, in an advanced form, of the first five volumes of the *Microcosm* named above. The second volume of the *Arena* is not yet printed and bound, but will be after a while, and will then be included in the "Scientific Library," at the addition of \$1. Those desiring it are now sending in their names. As soon as 250 names are received it will go to press.

4. The Text-book on Sound, bound in cloth, price 50 cents, is one of the most important of the entire series of the Eight volumes. It is by the Rev. Dr. J. I. Swander, under our own most careful revision, and no man can read it understandingly without being convinced of the absolute truth of Substantialism.

### Dr. Wilford Hall's Scientific Library.

[From the *Arena*.]

"The principles of the Substantial Philosophy, with their collateral bearings, which are unfolded in Dr. Hall's writings, have cost him more than ten years of unremitting labor, such as few men besides himself have ever performed. The results of this tireless scientific and philosophical research, as therein elaborated and set forth, can be found in no other library of books on earth; and those who fall of the present opportunity to secure these unique works, at the trifling cost proposed by his publishers, will realize a missing link in their chain of knowledge, which they may always regret and may never be able to supply."

### Eight Volumes that Will Live.

"This Library consists of the "Problem of Human Life" (\$2), the five volumes of *THE MICROCOSM*, bound in cloth (\$7.50, or \$1.50 each), the first volume of *THE SCIENTIFIC ARENA*, bound in cloth (\$1), and the "Text-Book on Sound" (50c.), amounting in all to \$11.

"By special request of Dr. Hall this entire library will be sent to any person by express on receipt of \$5, if ordered soon, or before the plates shall pass into other hands—an event probably not far distant. If sent by mail the postage, \$1.25, must be added.

"No person who has tasted the fruits of this comforting and elevating system of doctrine, as set forth in those volumes, should allow this opportunity to go by for leaving to his children an heirloom which may prove an almost priceless memento in coming generations. Bear in mind that this library can only be obtained by addressing the Editor of this paper."

### Appleton's Encyclopædia.—A Great Offer.

"We have several sets of "Appleton's Encyclopædia," second hand but in excellent condition (not the illustrated edition, but the one previous), 16 large 800-page volumes, in leather binding \$30; or in cloth \$24. Either set is worth to any student double this amount. Let no man complain after this that he lacks the facilities for obtaining universal knowledge, a thing which is only possible with a good encyclopædia.

Address A. WILFORD HALL,

Editor of the *Microcosm*,

23 Park Row, New York.

### Three Cash Prizes—\$30, \$20 and \$10.

Our contributors, and our literary, scientific and philosophical friends should not forget the opportunity we have presented for earning one of the above-named cash prizes during this volume by sending us an essay on Substantialism or collateral discussions. Remember, these essays must not be more than a single solid page of this paper, in briefer type.—1,200 words. See this announcement as first made in December, or in No. 1, of this volume. A number of writers, as we learn, are preparing themselves by study for this contest.

## What the Press Say.—A Mere Specimen of Hundreds of Unsolicited Notices.

### "A Masterly and Triumphant Refutation."

[From *The Christian News*, Glasgow, Scotland.]

One of the most trenchant and masterly opponents of this theory (Darwinism) is Dr. Wilford Hall, of New York. Some time ago he wrote a book entitled *The Problem of Human Life*, in which he subjects to a searching and critical analysis the strongest arguments in favor of evolution advanced by Darwin, Haeckel, Huxley, and Spencer, the acknowledged ablest exponents and advocates of the system. Never, we venture to say, in the annals of polemics, has there been a more scathing, withering, and masterly refutation, read or printed. Dr. Hall moves like a giant among a race of pigmies, and his crushing exposures of Haeckel, Darwin & Co. are the most sweeping and triumphant we have ever read within the domain of controversy. If our thoughtful and critical readers have not yet read the book, we venture to prophesy that they have a treat before them.

### "The Book of the Age."

[From *The Methodist Protestant*, Baltimore, Md.]

This is the book of the age, and its unknown author need aspire to no greater literary immortality than the production of this work will give him; and thousands of the best-educated minds, that have been appalled by the teachings of modern scientists, will "rise up and call him blessed." Hitherto it has been the boast of atheistic scientists that the opponents of their doctrines have never ventured to deny or to solve the scientific facts upon which their theories are based. But our author, accepting these very facts, unfolds another gospel; and Tyndall, Darwin, Haeckel, et al, are mere pigmies in his giant grasp.

### "The Most Startling and Revolutionary Book."

[From *The Brethren at Work*, Mount Morris, Ill.]

It is unquestionably the most startling and revolutionary book published in a century. There is no escape from the massive accumulation of facts and the overpowering application of principles in which the work abounds from lid to lid. It marks an epoch in the centuries. It is a work of Providence, and will not accomplish its mission in a generation. It unfolds truths that will stay as long as Christ is preached. Although strictly scientific, its one aim is the demonstration of a personal God and a hereafter for humanity. We never tire reading it. It is an exhaustless mine of Christian truth. It is the literary *chef d'œuvre* of the age. It is worth its weight in diamonds.

### "Meets the Wants of the Church."

[From *The Dominion Churchman*, Toronto, Canada.]

We most cordially concede to *The Problem of Human Life* the well-earned title—the book of the age. Doubtless the God of Providence has raised up the author to meet the wants of the Church in this time of need.

### "Originality, Thoroughness, and Ability."

[From *The New Covenant*, Chicago, Ill.]

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# The Microcosm

A MONTHLY JOURNAL OF SUBSTANTIALISM AND COLLATERAL DISCUSSIONS.  
THE ORGAN OF THE SUBSTANTIAL PHILOSOPHY.

A. WILFORD HALL, Ph. D., LL. D., Editor and Proprietor.

(Author of the "Problem of Human Life," "Universalism Against Itself," Editor of the *Scientific Arena*, &c., &c.)

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Address all communications to A. WILFORD HALL, 23 Park Row, New York.

Vol. VI.—No. 11.

OCTOBER, 1889.

50 Cents a Year.

Entered as second class matter at the New York Post Office.

## INCONSISTENCIES OF THE MOTION-THEORIES OF SCIENCE, No. 4.

Is Sound Motion, or Substance?

BY THE EDITOR.

Our scientific school-books teach us that the prongs of the tuning-fork in order to send off atmospheric "condensations and rarefactions," supposed to constitute sound, must advance "*swiftly*." That a slow motion such as that of the clock-pendulum, say a foot in a second, or the movement of the hand, will not produce a condensation of the air, because, as urged by the renowned Prof. Stokes, of Cambridge University, the air-particles have time to slip from in front of the pendulum and take their places behind it, and thus not be condensed. This Prof. Tyndall also distinctly tells us in his Lectures on Sound, page 62.

Now it was demonstrated by careful experiment by Capt. R. Kelso Carter, Professor of higher mathematics at the Pennsylvania Military Academy, as published in the *MICROCOSM*, Vol. III., that the tuning-fork will continue audibly to sound when the motion of its prongs is reduced to a velocity of *less than one inch in two years*, or to a speed 25,000 times slower than that of an ordinary clock-pendulum when beating seconds. Yet wave theorists who had formerly taught and believed that it requires a "*swift*" movement of the prong to produce an air-wave, now ignore Prof. Carter's demonstration and still teach that sound consists of air-waves!

As sounds, according to this theory, consist of the undulations of the medium through which they are driven by the vibrations of the sounding body, it is plain that the more easily condensed this wave-medium is, the more easily will the undulations be produced and the farther should they be sent by a given vibratory impulse before dying out. Is not this reasonable? But what are the scientific facts in the premises?

Take a solid mass of iron a mile long and let the ear be placed in contact at one end, and it will distinctly hear the scratch of a pin at the other end. Yet let this pin be scratched against a piece of isolated iron in the open air, and with this atmospheric medium connected as it is directly with the tympanic membrane, and it can not be heard six feet away! Why is this, if sound consists of the wave-motion of the medium which conducts it?

In other words, if sound is constituted of the condensations and rarefactions of the conducting medium, as the current theory teaches, why does not the air, which is so very compressible and so easily thrown into undulations, convey the sound thousands of times better by this wave-motion than iron which is almost infinitely more difficult to be condensed or thrown into waves?

If sound consists of the undulatory motions of the particles of the medium conveying it, then why in the name of physical and mechanical law do not these waves, which are started in the iron bar so difficult to condense, slip off at its sides into something easier to condense, and thus disappear from the more difficult medium before it goes even a foot?

Suppose a stream of thick mud and a stream of water running side by side and touching each other, and that a system of waves be started down the stream of mud. A man with half an intellect can see that these purely mechanical waves would take to the water, the more easily undulated medium, and travel on much farther and much easier than in the mud, the more difficult medium to undulate.

But start the system of waves in the stream of water, and they would run along the very edge of the mud for any distance, without the least transference of their undulations to the denser medium, simply because the water is the more mobile of the two mediums and the more easily thrown into wave-motion.

Hence it is a monstrous absurdity to claim sound as waves of condensation and rarefaction instead of a substantial force, when it

travels so much better in the medium which is the more difficult to condense and rarify.

If there were any truth in the teaching of the wave-theory, that sound travels through iron as wave-motion, or in the form of condensations and rarefactions, it is plain that the entire atmosphere surrounding the iron mass should be permeated with this merely mechanical wave-motion; whereas an ear placed within a quarter of an inch of the far end of the iron bar can not hear the sound of the scratching pin.

Mechanically, as condensations and rarefactions, such ear should more readily hear the sound in the air, it being so much more easily condensed and rarefied than the iron bar itself. But as an immaterial, substantial force sound possesses the peculiarity of a repugnance, when started in a medium of one density, to change to one of another. The ultimate reason for this can no more be given than why electricity will travel through metal but abhors glass, both being under the control of cohesive force which reigns supreme in material bodies.

If sound does not consist of condensations and rarefactions, or, in other words, of wave-motion, how then, asks the reader, can we account for its seventeen-times greater facility and velocity through iron than through air? The wave-theory as just seen can give no sort of explanation of this well-known fact on its purely mechanical principles. But the true solution of sound-conduction, according to Substantialism, is a simple problem, provided we do not seek to reach ultimate principles. It is because iron is a better conducting medium than air or anything else for this form of substantial force. It travels through any given medium, just as does electricity, according to its conductive quality under the governing control of cohesive force. Substantial electricity will refuse to go through dry air perceptibly even for a single foot, while it will go through solid iron thousands of miles a second and with great power, simply because cohesion, the regnant force of material nature, has so arranged its particles as to make it a better conductor.

How simple and beautiful are the phenomena of the conduction of sound-force and electric force, so analogous yet so unlike, when explained on the scientific principles of Substantialism! Iron being a better conductor of sound than air, hence sound as an immaterial substance travels better and swifter through the former than through the latter; whereas it would necessarily be exactly the reverse if it travelled as wave-motion and for the reasons given.

The youngest beginner in a philosophy-class

could see this manifest mechanical distinction at its first suggestion, and would be able to silence the ablest professor who should attempt to defend the theory of atmospheric sound-waves. Let such beginner ask his teacher the simple question if electric force goes through iron by driving its material particles into waves or pulses of condensation and rarefaction? The teacher would be compelled to answer no;—it simply travels in a stream of substantial force itself, either unbroken or intermittent, according to the method of its liberation from the force-element of nature. Then why, the student can retort with crushing effect, may not sound travel through iron or through any other conducting medium on the same consistent and philosophical principle as substantial but immaterial force?\*

Again, if the sound travels through iron in waves or undulations, giving to the iron particles a to-and-fro motion having a determinate amplitude of vibration (as all waves must have an amplitude of the undulating substance, or they are no waves at all), then the scratching of a pin on a million tons of iron must displace every particle of this mass in relation to every other particle causing a churning or a to-and-fro commotion of each and every molecule of the iron throughout a determinate distance so long as the sound is kept up!

In the name of reason is such a manifest mechanical impossibility as likely to be true in science as that this scratching of the pin liberates a quantity of sound-force from the force element of nature, which travels throughout the mass of iron by its own law of conduction analogous to the travel of electric-force, and without any disturbance of the material medium save that incidental to the scratching of the pin.

No wonder that professors of physics, who are now using our text-book setting forth the substantial theory of sound, write us enthusiastically that their classes, even the youngest of the students, have no difficulty in grasping the most complex sound-phenomena explained as they now are on the basis of Substantialism, since such solutions are so much simpler than

\*When writing the "Problem of Human Life" we were fresh from the line of thought which made *matter* and *substance* synonymous terms, and as a consequence we were occasionally, in the hurry of getting out the book, betrayed into the use of the term *matter* where it should have been *substance*. But almost uniformly the proper distinction was maintained between *material* and *immaterial substances*, a fact which candid reviewers have always understood and recognized. A few uncandid and quibbling critics, however, have been only too eager to fasten even upon a manifest typographical error in order to disparage the general and unanswerable drift of this teaching.



those formerly given on the old theory of wave-motion!

Then again: If sound travels through a mass of iron as waves of condensation and rarefaction (and wave-theorists do not pretend that sound has two methods of traveling, one by wave-motion in air, and another by something else in solids), it follows that so-called wave-lengths must hold good in our supposed mass of iron the same as is claimed in air. No physicist will dare to dispute this conclusion unless he wishes to stultify the wave-theory and make it ridiculous.

Now what is a *wave-length* as defined by every text-book on sound? It is the distance from the center of one wave or condensation to the center of the next one adjoining; and as each forward motion of the vibrating instrument starts a wave, it necessarily follows that the wave-length in any system of sonorous undulations depends upon the rapidity of the vibrations causing them in relation to the velocity of the sound through a given medium; or, in other words, the distance the first wave travels before the next following wave starts. Thus given the atmosphere as the medium, in which all sounds, high or low, soft or loud, travel with uniform velocity, and the wave-lengths depend entirely upon the pitch of the sound or the rapidity with which the waves succeed each other. Of course it is well known that the pitch of any sound depends upon the number of vibrations of the sounding body in a second, whether these vibrations liberate substantial pulses of sonorous force, as the new theory teaches, or send off air-pulses as the wave-theory teaches.

Having thus prepared the way for our final *reductio ad absurdum*, it follows that in air, in which sound travels 1,120 feet a second, the low D of the double bass (the lowest note of the orchestra), which makes 40 vibrations a second, must have a wave-length of just 28 feet, as 40 into 1,120 goes 28 times. But if we hold this double-bass instrument against our mass of iron and sound it, we necessarily increase the wave-lengths, or the distance from condensation to condensation, since it is well known that sound travels 17 times faster through iron than through air, or at a velocity of 19,040 feet a second. Hence, by multiplying the wave-lengths of the double-bass, 28 feet in air by 17, the greater velocity of sound in iron, we have the wave-length of the double-bass undulations as held against our mass of iron 476 feet from condensation to condensation, or from crest to crest,—greater in amplitude, if they are real waves, than the largest ocean billows?

Yet the prodigious absurdity of the whole theory comes to the surface when it is con-

sidered that these so-called enormous iron undulations, with actual wave-lengths of 476 feet from centre to centre of adjoining condensations, which Helmholtz declares to be "of a precisely similar nature,"—"essentially identical with that on the surface of water,"\* have absolutely no amplitude at all, the iron particles not having been displaced by condensation or by to-and-fro disturbances sufficiently to be detected under the most powerful microscope! Still this most monstrous of all conceivable absurdities in science is now gravely taught by physicists in our schools and colleges even when they know of a text-book which is entirely consistent with every fact of nature and with every principle of reason. But more in the next number.

#### PRIZE ESSAY No. 17.

#### A Substantial Government, No. 2.

BY REV. D. OGLESBY.

The Editor of the MICROCOSM very kindly gives me the privilege of showing that money is not property, nor the "exact equivalent of property."

I am very glad of having the opportunity to do so.

#### MONEY NOT PROPERTY.

Money is not a material thing. It is an *ideal* thing. It is a creature of law. It has no color or shape, no length, breadth or thickness. It is the *fiat* or command of law. The materials used for making money, or in which to impress, engrave or print the command or authority by law, have all the qualities above named, because they are material substances. Lay an eagle of gold on an anvil, and you can knock the money out of it at one blow with a sledge hammer. Lay a gold or silver coin on a railroad track, and after the cars pass over it, the money is gone, although the metal remains.

Money is said to represent property. But it does not, or *should* not. Indeed a true money can not. It is invented and made to represent the *price value* of property.

Property is a material substance; the price of property is an ideal thing. The price of property differs from property more than its color, weight or dimensions do, because these qualities can not vary, while the price of property is fixed by the whim of the owner and markets, and is as variable as the wind. The *price value* of property is what money is intended and does represent.

Property has two kinds of value. Intrinsic value, and commercial or exchange value. The exchange value is really the amount of labor that enters into the production of property. Money is designed to show the relative amount of labor, or *value in labor*, of articles that are in the market for sale or exchange.

Money can not represent the intrinsic value of property. A loaf of bread worth only a dime in market, might be of incalculable worth *intrinsically* to a man crossing a desert. A life preserver costing but a dollar or two, is as valuable as life itself to one on a sinking ship. Money represents, not property, nor its intrinsic

\* "Sensations of Tone," pp. 14, 15.

sic value, but its commercial or exchange value.

Although money may be said to represent property, as a shadow represents a tree, it can not be an "exact equivalent" of property any more than the shadow can be an "exact equivalent" of the tree; because property is a material substance, and money is an ideal thing. But money can be an "exact equivalent" of the price value, or commercial value, for both money and price are ideal things. Money is a labor ticket or check. It may be written on any substance. All that money can correctly do, is to show the *relative value in labor*, as before stated, of all articles for sale or exchange. Anything which society might agree on to do this, will be to all intents and purposes, money. Public sentiment is crystalized into law in making money, and it is called "legal tender." This is a necessity on account of debt. There must be something to stop the sheriff. Legal tender is the debtor's breast-work of defense.

I think that the foregoing is sufficient to show "how money can represent property as a means of exchange and not be property nor its exact equivalent." It does its work of facilitating exchanges, by representing the *relative value in labor* of the articles to be exchanged. It will be seen also that money is made to do business *with*, and not to *deal in*. To talk about a "money market," or the "price of money," is to talk about the price of a price, and shows an entire perversion of the function and office of money.

The reason why money-mongers contend for coin money, or a coin basis money, is twofold. First, it keeps the masses deceived, and makes them believe that money is property. And believing this, usury follows as a matter of right. For it may be right to charge for the *use* of property sometimes. Secondly, it enables the money-mongers to keep the volume of money small, and thus not only create debts, but perpetuate them, so as to reap the annual crop of usury.

But for this false system of property money, there would be scarcely any debts in our world, and no one would care how much money his neighbor had, any more than one farmer cares how many horses or wagons his neighbor has.

But it is to the interest of the class who *deal in money* to make it scarce so that others will be compelled to borrow of them. And to accomplish their purpose they get control of the governments, or money-making power.

There is a vast conspiracy working on this line, extending throughout the civilized world. The Hazzard circular revealed the plot. It is the "European plan."

Property-money is a monarchial money. It is subversive of liberty and equality, and will destroy any republic.

We might as well be under the government of a king as under the control of moneyed monopolies.

If we could abolish trusts and combines tomorrow it would be only a question of time under the operation of our property moneys until they would come up again. The true policy is, or would be, for the government to furnish to the people the money needed to make exchanges at cost of issuing and handling.

No government can be a *substantial*, permanent one that allows its *medium* of ex-

change to create an idle aristocracy to enslave the masses. European governments are in a ferment, like the tempest-tossed ocean, principally from this cause. Carrying an army of 12,000,000 of men, carrying a load of royalty, crowned heads with a horde of pensioned idle attachees, lords, dukes, knights, etc., etc., it is only a question of time until the back of labor will be broken.

One of England's foremost statesmen said recently that unless they had a great war soon the finances of Europe would collapse.

The great catastrophe may be delayed for a time by so-called charity, building poor houses, asylums and prisons, increasing the police force; but they inevitable will come, for usury, like a rolling snowball becomes larger and larger.

The true policy would be for the government to issue to the people all the money needed to carry on the business or the country at cost of issuing and handling.

The people are the government. The people make the money. It is made for all, for one as much as another. It is made to *use*. The individual's right begins and ends with *use*. Justice is what our world or the human race needs. No government is *substantial* and safe that fails to mete out justice to all its subjects alike.

But with a false system of money injustice follows as effects follow causes. It is a poison in the body politic. It is like the taint in the blood of the leper. The child is beautiful. Its dimpled cheeks and sparkling eyes give no symptoms of its coming fate. It grows up to youth, to manhood and womanhood, its countenance radiant with the appearance of perfect health; but death lurks in its blood, and its doom is sealed. So the governments of the civilized world are diseased. It is blood-poisoning. The money systems have in them the element of disease, the seeds of death. Certainly no European government gives evidence of health and longevity. Their weakness is such that they lean on standing armies and on each other. Our own Republic is threatened with anarchy and internal dissensions, because of injustice to the masses growing out of false money. It is to be hoped that God in his providence will raise up men to stand at the helm, and guide the ship of State through the breakers to the harbor of justice and safety. Men we need now—never so much as now—"who fear God and hate covetousness."

Richview, Ill.

#### REMARKS BY THE EDITOR.

We are still puzzled notwithstanding the many fine distinctions of our very critical contributor.

If money is the exact representative of the market *price* of property, as he admits, we fail to see why money is not the exact market equivalent of the property itself.

If we have a horse worth in the market \$100, and Mr. Oglesby has \$100 in green backs or gold eagles, for the life of us we can not see why the \$100 are not as much and as really property as is the horse.

If we let him have our horse and take his \$100, we feel intuitively that we have the

exact equivalent of the property we had parted with, because with the \$100 we can obtain as good a horse, or other tangible property that we may need more than we did the horse.

To say, as does our contributor, that the \$100 represents the *price* of the horse but not the horse itself, is, to our mind, a distinction without a difference. Surely the *price* of the horse represents the actual horse itself in the market. Why then do not the \$100 which represent the *price* also represent the *horse*?

If instead of \$100, suppose our friend had 100 bushels of wheat whose market price was \$1 per bushel, and we should sell him our horse for the wheat, would he insist that the wheat represents the *price* of the horse, or would he take a shorter cut and admit that his 100 bushels of wheat really was the exact equivalent of the horse itself?

The reason why the wheat would exactly represent the horse as well as its *price* is because both wheat and horse exactly represent \$100, each being so much actual *property* in the market sense of property.

Now in regard to the right to own and dispose of money as property, we confess we can not understand the position of our contributor.

He seems to insist that it is the business of the government to manufacture its fiat-money for all the people equally at the exact cost of its production. Now it is well known that the actual cost of a large quantity of \$10 greenbacks at the present market value of labor and materials is not one cent on the dollar.

Suppose, for example, that the government should, on New Year's Day next, start out on the fiat principle suggested by our contributor, and that he should be the first one at the door of the printing office and should receive \$100 for one bushel of wheat as the exact cost of the greenbacks. Could he then make that \$100 in fiat-currency represent the price of our horse? No, because we could go to the printing office ourselves, just as he did, and get a hundred times as much of the fiat stuff for our horse as he got for his bushel of wheat, simply because our horse represents 100 bushels of wheat in the market, as well as 100 old-fashioned dollars.

The truth is such fiat money would only be worth what it would actually cost to produce it in labor or its equivalent in other substantial property; and \$100 in such money would never represent but one bushel of wheat at the present market price of wheat and its equivalent in labor.

But suppose the government should adopt our contributor's plan of issuing fiat-money at the exact cost of its production, and that friend Oglesby had no bushel of wheat or other substantial property-equivalent with which to obtain the \$100 at the government printing

office, how is he to get his \$100 in greenbacks?

The printer will not let him have it, remember, except at the cost of production and handling. Of course our friend would be obliged to struggle along without money till he could manage by labor or in some other way to obtain some real property with which to pay the printer for the fiat greenbacks.

But even then, he would not need to go to the government at all for a supply of fiat-money, because his more fortunate neighbors who want wheat or horses, would let him have greenbacks at the same price for their equivalent that the government would, they having laid in a stock of money at \$100 a bushel for wheat, or \$10,000 for a good government mule.

But suppose everybody should get greenbacks from the government at the cost of production and handling,—one cent in wheat on each paper dollar. And suppose Mr. Oglesby, more frugal, industrious, and financially shrewd than his neighbors, should manage to trade them out of their fiat-currency; would there be anything wrong in his returning the money thus earned as exactly representing the price of so much wheat which he had traded for it?

Would he be expected after securing by legitimate traffic all the greenbacks in his neighborhood, to divide up again with the indolent men who had not business sense enough to keep their money after they had bought it of the government?

Of course our contributor would have a legal right to keep the greenbacks he had honestly accumulated and thus would become what they might call a bloated bond-holder or a capitalist among his neighbors, and might justly, for aught we can see, open a bank, and loan out his money thus honestly acquired at a fair interest to those who should need it in trade, just as much as he could loan seed-wheat to his neighbors to be paid in an equivalent of sweet potatoes.

But the very idea of setting up a government on such a financial basis as mapped out by our contributor explodes his whole argument against money as property.

His plan of having the government issue fiat-money and furnish it to all comers at the cost of production and handling necessarily makes it property the same as it would make our MICROCOSMS property if we should sell them to our subscribers at the cost of paper, printing, handling and postage, which we actually do.

The very idea of purchasing from the government its fiat-currency at any price whatever, makes it *property* in the strict sense of



the term, since the simple fact of *buying* a thing necessarily gives it a property character at the very start.

It is, therefore, impossible for a man in the very nature of commercial transactions to buy any article at any price except that which is property or its exact equivalent; so that our friend, in suggesting the proposition that government sell to purchasers its fiat-currency even at cost of production and handling, stultifies at a single sweep of his pen all his objections to money as property.

And if government would have a right to sell us money as property, even at the cost of production and handling, we would have an equal right to sell the same property back to the government, or to our neighbors, or to buy it from our neighbors, or take care of it and invest it for our neighbors at a fair compensation for the labor thus involved in handling it, and this is exactly what is meant by a legitimate banking business.

Money, therefore, is more really and intrinsically property, in the essential meaning of that term, than is any other purchasable or salable commodity or possession ever owned by man, since money of any kind, authorized by the powers that be, actually represents and stands in the market as the equivalent of every variety of property known to commerce.

So far, therefore, from money not being property, it is the quintessence of property, or in other words, it is property boiled down and refined to its most convenient dimensions.

Mr. Oglesby, of course, is right as to the fact that neither paper, gold, nor silver is money and that either one of these substances, whatever their intrinsic value, is only money in consequence of the governmental stamp impressed upon it.

Canvas and paint are very cheap commodities, but when two or three yards of the former and a pound of the latter, costing only a couple of dollars, have been manipulated by the brush of a Reubens, they become changed into actual property worth thousands of dollars in the market, just as a small piece of paper, not worth one penny, after receiving the government stamp, passes everywhere as the exact equivalent of \$10,000 worth of property of any description to be found in the United States markets.

The servant who regarded his money not as productive property but who hid it in a napkin was condemned as slothful; while the servant who had an eye to business, who looked upon his money as valuable property to be dealt in, put out at interest and used for legitimate gain, was commended by his lord as a model of frugality and industry.

#### PRIZE ESSAY No. 18.

#### What is the True Philosophy of the Purification of the Blood in the Living System?

BY MRS. M. S. ORGAN, M. D.

This may seem a strange question to propound to-day, when the scientific world considers that it has established a theory regarding these physiological phenomena that is incontrovertible. But facts upon which theories are built, are not always correctly interpreted; and when we bring the focused light of true science to bear upon this theory, it will reveal a premise that is radically false.

This theory is based upon the assumption, that the laws of chemical action are not suspended by vital force;—that they are still active in the growth and development of organic forms;—that the oxygen of the air sustains the same relation to the lungs as food does to the stomach;—that in the change of venous to arterial blood it imparts to it a vivifying power, and which is appropriated in the process of assimilation.

If this theory be correct, there is no line of demarcation between the kingdoms of organic and inorganic structure, and chemical force is the natural and harmonious adjunct of vital force. This, is certainly antagonistic to all the revealed conditions of vital action. All demonstrated facts clearly indicate that there is no affinity relation between the operations of chemical and vital law—that the realms of chemistry and vitality are separate, distinct and antagonistic. Vitality suspends inorganic affinities, and then by a process different from, and superior to, all operations in the chemical world, transmutes inorganic elements into organic substance.

Certain kinds of seeds have been planted in leaden shot, and supplied with nothing but pure distilled water and the sun's light and heat, and have grown and attained maturity; and when subjected to chemical analysis, have yielded the various earths, acids, alkalies, metals, carbon, sulphur, phosphorus, oxygen, nitrogen, etc. This demonstrates beyond all doubt, that chemism does not pertain to vital growth and formation; for by no possible chemical combination of the inorganic elements from which the plants elaborated their structure, could such a residuum be obtained by chemical analysis. This fact alone, is sufficient to demolish the theory that chemical law is operative in living structure; for, according to the highest authority in science, if but one single fact can be adduced against a theory, it is as completely overthrown as if a thousand were brought against it.

If then, there is no chemical action in the constructive process of living structure, how, it will be asked, is the blood purified? For it is a well demonstrated fact, that oxygen unites, in the air-cells of the lungs, with the carbon of the blood, forms carbonic acid gas, and this compound is then expelled from the system?

While there is no chemistry of the body, to a limited extent there may be chemistry *in* the body. For instance, if a poison is taken into the stomach, it may be rendered comparatively innocuous by an antidote, and in this changed form the vitality be able to expel it. But this chemical action is in no sense a part of the nutritive or formative process; the whole action is essentially destructive, and

the stomach is simply a receptacle for the chemicals, as might be a metallic basin. Analogous to this process is the oxygenation of the blood.

When the venous blood arrives at the lungs, it is charged with the broken-down tissues of the body; this impurity or poison is thrown into the air-cells of the lungs—sewerage drains of the body—oxygen is an antidote for this poison, unites with it and forms a compound which the vital force can expel.

Oxygen is used in the organic economy only as an antidote; it is simply a scavenger cart, upon which the lungs load their accumulated impurities, and through the expulsive energy of the system it is cast into the aerial ocean.

Observe, oxygen in and of itself has no power to carry off this load of carbon, it merely combines with it through an affined chemical law and changes its form; but the dynamic force which expels it, is the vitality of the body. In this chemical combination it is ever destructive, never constructive of organic formation.

When the vital force has thrown the disintegrated tissue of the body into the channels of circulation, it has forever disposed of it, so far as any use can be made, in growth or formation.

Oxygen does not, and can not, impart anything to the blood; when the blood arrives at the lungs it is fully charged with vitality, and takes on no additional force when relieved of its carbon; for all the vitality the blood ever possesses, either as venous or arterial, has been evolved through the workmanship of the inherent vital principle.

Oxygen is an element of the inorganic world, and animal vitality is constitutionally related alone to organized matter in all its processes of digestion and assimilation. Without the mediate force of vegetable vitality—which is directly related to the elements of the inorganic world, and has the power to transform them into organic structure—the animal world could not exist; for animal vitality can only use matter that has been elaborated and constructed through vegetative life.

When the animal system suffers injuriously, or dies from want of air, it is not from want of sustenance, but solely because its machinery is clogged up, by an accumulation of carbon in the lungs; it has no vehicle (oxygen) upon which to load its poisonous material.

If chemical laws are not suspended by vital force—if they are in any measure operative in the constructive process of the organic economy—then there is no barrier between the organic and inorganic kingdoms—spontaneous generation is a certitude—drug-medication an essential in restoring unbalanced organic functions, and those forces denominated vital, mental and spiritual are but the operation of chemical affinities under peculiar conditions;—they are but the result of material atoms acting through inherent force. And the materialistic creed, that "matter contains within itself the promise and potency of every form of life," thus becomes a scientific verity.

From these considerations it becomes manifest that the true explanation of the *modus operandi* of the purification of the blood, involves a principle which in its fundamental, affects the physical, mental and spiritual interests of the human race.

249 W. 125th street, N. Y. City.

**PRIZE ESSAY, No. 19.**  
**THE NATURE OF FORCE.**  
BY WALTER F. GOTTWALLES.

Force is an absolute entity, an immaterial substance, having but few, if any, of the recognized characteristics or properties of matter even in its most attenuated and refined condition.

These facts have been shown in the various discussions of Substantialism so often and so fully, that little in the way of argument or proof needs to be presented. We can but elaborate what has been so conclusively set forth and illustrated in the "Problem of Human Life" and in the *MICROCOSM*.

Immaterial, substantial force, being conditioned on a general plane of material bodies, must, in the nature of things, be susceptible of moving or not moving, as the case may be.

That various forms of force may be less energetic or active at some times than at others, is a well-established fact; and it even follows that force which is generally active, may at other times be in a static or quiescent condition.

In the physical realm, force has no will or volitional power, but is governed by fixed laws in its velocity of movements, method of producing results, etc.

In the organic realm, on the other hand, force has not only similar involuntary characteristics to those of the physical forces, but a great deal higher form and power, and the more so as the higher orders of organic being may be recognized, in which the force itself has delegated to it the power of choice,—the power to *will* to do this or that. The highest grade of this form of force constitutes rational personality, and in which consists human responsibility of action, etc.

Force does and can exist separate from matter. According to Substantialism, matter, in its strict and definite sense, once had no existence at all. As to the possibility of matter existing without some kind of force, it becomes a somewhat tangling and unsolvable problem on its face. It is generally believed, however, that tangible matter can not exist without the influence of various kinds of force, such as cohesion, gravity, heat, etc.

Force as well as matter, is a real, substantial entity, and is subject, in the very meaning and nature of substantial existence, to the conditions of locality, intensity, divisibility, etc., and must, therefore, be capable of attenuation or concentration, and is conceivable as present or absent in a given place, and hence must be composed of particles or separable portions.

A particle of matter is but a small portion of matter. The smallest conceivable particle of any substance, if separated from the main body, is the same individual particle of substance it was when not separated, and when constituting an undivided portion of that substance.

The same properties and conditions of divisibility and extension, which exist in air, must also exist in immaterial substances, such as magnetism, electricity, heat, gravitation, etc.

Force must be a real, substantial entity, because it produces physical results, such as the displacement of ponderable bodies, as in the case of heat, magnetism, gravity, electricity, etc.

But substantial force can no more act of itself than can substantial matter. All forms of force have received, in the organization of the universe, the delegated power to travel in space by certain laws peculiar to each form, as well as the power to affect and move other bodies of a ponderable character.

Matter, on the contrary, is absolutely inert and can neither move, change its course nor stop moving except by the application of extraneous and substantial force.

The idea of the molecules of matter being in motion inherently, or as their normal condition without the application of extraneous force as the cause of such motion, is so great an absurdity, as frequently shown by Dr. Hall, that it is difficult to conceive how the authors of our text books on physics could ever have fallen into it.

A molecule can no more move of itself or without the energetic action of previously applied force as a substantial cause, than could a granite boulder weighing a ton. Yet science not only teaches that these little boulders (molecules) move of themselves with great velocity, and keep up this full velocity and amplitude of oscillation after millions of collisions with each other without any previously applied force, but it teaches the almost infinitely greater absurdity that these motions of the molecules thus occurring constitute the very force which keeps them moving! And this prodigious error is taught as science in all our colleges.

Substantialism was the first formulated attack upon this monstrous fallacy, and for about a decade of years its founder has been pouring his monthly chain-shot of reason, logic and philosophy into the untenable and inconsistent teaching, till now physicists are coming to see that there is really something radically false and wrong in the text books of our schools.

Plainly Substantialism is the only remedy for this error, and must in the very nature of things soon cause a revolution in the whole range of the current course of college instruction in physical science.

Whether or not the present generation, under the prevailing prejudices of the average professor, shall accept Substantialism in lieu of the baseless principles of physics as now taught, it is certain that the coming generation, when sound reason shall take the place of prejudice, will do honor to the man and the system of philosophy which have placed the forces of nature in their true light before the scientific world.

[Will Mr. Gottwalles kindly send us his post-office address?—Editor.]

#### PRIZE ESSAY, No. 20. WHAT IS MATTER?

BY PROF. D. JAMES.

If materialists will answer this question, they may then demand a definition of immaterial substance.

Matter is supposed to be known by certain properties; but, in the light of Substantialism, what are termed properties of matter, can be shown to be phenomena produced by force.

It is as scientific to assert that matter is a property of gravity, as to teach the reverse. It can be shown that gravity does exist apart from matter, but it has not been proved that

matter exists anywhere independently of gravity. If either is a property of the other, it would seem that matter has the better claim to the term "property." Substantialism treats them as distinct substances, generically different, depending, for their existence, solely upon the will of the Creator. Magnetism is not a property of the metallic needle to which it has been transferred, and gravity is not a property of matter. It is an entity, *per se*, and, to the mind of the philosopher, it is just as comprehensible as matter itself. The same scientist that teaches the passivity of matter, attributes to it the active property of gravity. A substance which is utterly passive, exhibits a constant activity! This is a contradiction. If matter is passive, let it preserve that characteristic under all circumstances.

*Inertia*, "which keeps a resting body at rest, and a moving body in motion," is nothing more than an effect of gravity, unless its significance is limited to the sense of passiveness of matter. In a vacuum, gravity moves a cannon-ball and a feather with equal facility, if not opposed by other forces. Any motive force would accomplish a similar *fete* under similar circumstances. What, then, becomes of *inertia*? If inertia does not mean merely the passivity of matter, it means nothing.

Figure, expansibility, compressibility, hardness, softness, tenacity, malleability, ductility, fluidity, elasticity, etc., which are called properties of matter, are simply phenomena caused by the operation of the forces, cohesion and heat. Porosity is a circumstance—it is not a property of matter. It expresses the idea that no known body is an absolute solid, but this is probably untrue, and, therefore, porosity can mean only, that in some bodies there are vacant spaces unoccupied by matter. Porosity is not a property of matter—it means the absence of matter.

By Dr. Mott's analysis, based upon data of orthodox scientists, impenetrability is shown to be an untenable property; for, if matter is infinitely divisible, every particle of space in a cubic foot of water must be occupied by oxygen and hydrogen at the same time. This is true of all composite substances. Wherever one of the component elements is, there the others are also.

The matter composing a block of ice, exhibits certain properties, hardness, brittleness, etc. It can not be said that oxygen and hydrogen possess these properties in their elementary state or in composition. The properties are due to the forces that control them for the time being. Add heat, and the ice is converted into a liquid, which exhibits new properties, the hardness and figure having vanished. A further addition of heat changes the liquid into a vapor, which is invisible and formless, but highly elastic.

Indestructibility belongs to force as well as matter.

Now, therefore, if the properties attributed to matter do not belong to it, but are the effects of force, how shall matter be defined? In attempting a definition of matter, the materialist borrows from force the substance of his argument. He defines force all the time. Matter is a thing that assumes an infinity of forms and conditions at the bidding of force. Wherever seen, it is subserving the dictate of force. Every attempt to grasp it, is utterly futile. We can weigh the block of ice, but this is only measuring the force of gravity. We can feel



it by permission of cohesion, and see it by means of light, but heat can render it intangible and invisible.

Matter must have properties peculiar to itself. Let the materialist define them, and in so doing let him steer clear of force.

The "properties of matter" need revision. Students would like to know which of the "properties" really belong to matter, and which to force—which are universal and which accessory. This is necessary to a proper definition of matter, since Substantialism has upset so many old notions. Dr. Hall is the successful innovator, and it is incumbent upon him to revise the "properties." Perhaps, he can help the materialist to tell what matter is when abstracted from the influence of all force. The doctor might put the bounds on that track for a while. When the game is "bagged," we will have force "marked and branded," so that every man may know it.

Vossburg, Miss.

#### DR. HALL'S SEVENTIETH BIRTH-DAY.

BY THE ASSOCIATE EDITOR.

The event toward which many of the *MICROCOSM* subscribers have looked with so much interest,—August 18th, 1889,—passed as quietly and as unostentatiously as the pleasant Sabbath on which it occurred.

Dr. Swander had sent to me the funds which had accumulated in his hands from the sales of his large work, "The Substantial Philosophy," as foreshadowed in previous numbers of the *MICROCOSM*—a modest sum by the way—to which a few friends of the editor had added enough to enable the writer to purchase, as a memento of the occasion, one of the most beautiful gold watches that could be obtained in New York. It is a fine B. W. Raymond movement, such as is carried by locomotive engineers.

Upon the front case of this magnificent timepiece, in an artistically engraved circle, is boldly chiseled "Aug. 18th, Wilford Hall: Seventieth Birth-Day Memento; 1889."

This watch, after carrying it for the remainder of his natural lifetime, the doctor proposes to leave to the College of Substantialism, should such institution ever be started, to be carried and used by each succeeding president of the same as long as its wheels will go round.

We regret that we were not able to make this announcement in the September *MICROCOSM*; but the reader would need no apology from us for the delay could he look into the busy hive at 23 Park Row, and see the daily amount of work turned out in supplying the increasing demands for Dr. Hall's Health-Pamphlet, a good per cent. of which has had to pass through the writer's hands.

The editor authorizes me to express to every purchaser of Dr. Swander's book, and to every other contributor to this beautiful souvenir, his heartfelt thanks for the same.

ROBERT ROGERS, Associate Editor.

#### FROM WHAT IS IMMATERIAL SUBSTANCES DERIVED?

BY ELD. C. P. EVANS.

Rev. J. I. SWANDER, D.D., Fremont, Ohio.

DEAR SIR.—I received your book, "The Substantial Philosophy," a few days ago, and am reading it with much pleasure, and, I

trust, with profit, and have just finished the perusal of the tenth chapter.

On page 224 in your answer to question 84 I find a statement that I do not comprehend, and I ask for light. Should my difficulty be worthy of an answer, I would be pleased to see the answer in the *MICROCOSM* as other readers may possibly observe the same difficulty. You are speaking of a burning candle as follows:—

"This process of disintegration in the luminous body does not change one particle of the material body into light force, just as the disintegrating process of the liquid battery does not change one particle of the zinc or acid into electricity," etc.

The first thought upon reading this was the lack of analogy between the material that furnishes the light, and that which furnishes the electricity.

The material which furnishes the light, the wick and tallow, or stearine, is consumed, the zinc and acid are not, so far at least as weight is concerned.

By the term consumed I do not mean annihilated, as in my preaching I have always taken the position that particles of matter in combustion are only changed not annihilated.

In the burning candle the wick is changed into ashes, the tallow is changed into something else, so that these particles of matter can not be gathered up again and molded into a candle as the dust of a disintegrated bell could be gathered up and recast into a similar bell.

I am also aware of the fact that the burning candle, or the substance thus undergoing disintegration, constitutes no part of the luminous rays passing therefrom. But the difficulty is in my mind and still remains as follows: That without the burning candle there would be no luminous rays, and that when the candle burns up the luminous rays cease. What, then, is it which furnishes this light or these luminous rays?

Will you be kind enough to explain still further and remove from my mind this difficulty?

I have read the "Problem of Human Life," the *MICROCOSM*, and the *Scientific Arena*, all with a great deal of interest, and I am reading your work with the greatest interest of which I am capable, and I earnestly desire to comprehend all that I read. May this suffice as a reason for asking further explanation?

Very truly yours,

Table Rock, Neb.

C. P. EVANS.

#### REPLY BY J. I. SWANDER.

Eld. Evans has raised a difficulty in connection with the new and startling phases of science developed by Substantialism, which is quite natural to those who have not yet had time for sufficient study to enter the inner temple of this grand philosophy.

That there should seem a want of analogy between the burning away of a candle for the production of light force, and the effervescence of zinc and acid for the production of electric force, is not at all strange. Yet after stating this apparent want of analogy, Eld. Evans himself seems to see and admit the two classes of phenomena to be substantially alike.

He says he has always preached that no part of the candle is annihilated by its combustion, though but a small part of it remains visible or tangible in the ashes and carbon of

the consumed wick, while none of the tallow is collectable by the ingenuity of the most expert chemist. This does not say but that had we infinite wisdom and power, we could re-collect and re-construct the perfect candle out of the materials thus dispersed, since none of them has ceased to exist according to the universal admissions of science.

So, precisely, is it with the liquid battery; by effervescence much of the acid and possibly some of the zinc have entirely disappeared in vapor, while in neither case does a particle of the substantial but immaterial light-force or electric-force result from a transformation or conversion of the substance of the candle or of the materials of the battery.

In the consumption of the candle, as in the disintegration of the zinc and effervescence of the acid, only a physical and mechanical operation goes on as a natural means of liberating from the force-element or force-reservoir of nature and thus setting free that substantial form of force—either light or electricity—evolvable by those respective processes.

Eld. Evans admits that the luminous rays emitted from the burning candle do not consist of any portion of the material substance of that combustible body. Then this light-force must be an immaterial entity, liberated from nature's fountain of force, while the combustion of the candle must be the process, or at least one of the processes, ordained in nature by which one form of force is transformed into others, such as light, heat, electricity, etc.

The same principle applies to sound-force. The bell may gradually be disintegrated by the blows of the clapper till it is so reduced to dust as no longer to be capable of emitting tone. Yet no part of the countless cubic miles of the sound-force thus sent off was constituted of the material substance thus reduced to powder.

True, this metallic dust, if all preserved, could be recast into another bell which would ring out when struck just as sonorously as did its predecessor of the same material, exactly as a new candle could be formed out of the dissipated tallow and wick which would burn just as brilliantly as did its predecessor,—had we the chemical knowledge necessary to re-collect the scattered particles and reconstruct them under the regnant laws of cohesive affinity into another candle.

But there are methods of evolving the substantial forces without any disintegration or consumption of matter whatever. Take the dynamo mechanical process in which no disintegration of material substance occurs, but which liberates both electricity and light, as well as heat, without the consumption of any material body whatever.

The electricity, for example, is generated, as frequently shown by Dr. Hall in the MICROCOSM, by the disintegration of immaterial, substantial *magnetism* in forcing the magnets abruptly and repeatedly from their attractive proximity. These magnets do not touch each other in their revolutions, and therefore do not disintegrate their substance or wear themselves out by friction, even against the air, as the dynamo would generate just as much electricity if run in a perfect vacuum as in the open air.

Then this substantial current of electricity, when thus evolved, if passed through the carbon candles of an arc-light, will produce its

illumination by consuming those candles, which almost entirely disappear, leaving only a slight residuum, just as in the case of the tallow dip.

But if we pass the electric current through one of Edison's incandescent loops in vacuo, we have intense light-force as well as heat-force evolved, and that, too, without the consumption of any material substance whatever in the liberation of these manifestations of energy from the force element of nature.

Should the objector urge that there still remains the disintegration of the coal consumed in the furnace, in running the engine by which to turn the dynamo-machine, etc.; we reply, not necessarily, since a water-fall will turn the dynamo-machine as well as a steam-engine; and thus we are enabled to see how the substantial force of gravitation may, by conversion and transformation, evolve and liberate from the force-element the substantial forces of heat, light and electricity; and then by passing the current in transit around a bar of soft iron we see how gravital force may re-convert electric force into magnetic force, and so on, all without the slightest consumption or disintegration of material substance of any kind.

This, in a word, we understand to be in accordance with the fundamental principles of Substantialism as originally set forth by its founder. Are we not right Dr. Hall?

[Yes, Dr. Swander is entirely correct in his exposition of the whole subject of the liberation of the various forms of force from the force-element of nature, and also of their transformation or convertibility the one into another. The doctor, we must confess, has very happily and clearly set forth the principles of Substantialism on the subject discussed,—much more concisely than we could have worded it ourself.—EDITOR.]

#### COPERNICANISM AND SUBSTANTIALISM.

BY THOMAS MUNNELL, A. M.

More than fourteen centuries elapsed between Ptolemy and Copernicus. During all that time no advance worth naming was made in the science of astronomy. Advance was impossible because the earth was held to be the centre of the solar system. The distance and diameter of the sun were alike unknown. The Greeks were the first to guess at it, and ventured to believe that "the sun was ten miles away," and having, of course, about sixty miles an hour to travel, could easily go round the world in the twenty-four hours. This false centre to the sun and stars assumed by Ptolemy, created endless confusion when he tried to systematize all lunar, planetary and stellar motions, and led to the invention of "epicycles" or cycle upon cycle in unlimited complications, without any satisfactory results. But when Copernicus mounted the sun and proclaimed him king and centre of all, the epicycles were no longer needed, and everything straightened out into order, beauty and harmony. The planets all took their places at respectful distances from the sun, the changes of the moon were accounted for, the seasons, day and night, and all astronomical phenomenon were soon understood.

From this we see the importance of securing the correct point of observation to comprehend any thing or system of things. To understand a man you must begin with his spiritual nature—his immortality. To describe an ani-

mal, the law of supply and demand of his physical nature is all you need to be concerned about. So with all the minor sciences; there is in each one a central idea, a main point of view from which alone it can be correctly understood.

The same is true of the great physical sciences such as Substantialism; for the more we think of it, the more value we see in the Copernican altitude to which the founder of the Substantial Philosophy arose when he announced the grand and dominant generalization that a substance is not only divisible, but is in fact *divided* into the two grand departments of *material* and *immaterial substance*.

The ease with which this central position is solving all the problems presented in the phenomena of the natural forces, proves it to be the only true observatory and standpoint from which may be viewed the entire harmony which exists between nature and the Bible, and from which also can be untangled the boundless epicyclical confusion of materialistic philosophy, as when it undertakes to explain the unseen but masterful forces by motion instead of substance.

Those who wish to prove that man is wholly material, try to strengthen their argument by proving that earth, air and sea contain no other than material substances. With them the earth is a huge hulk of matter without anything correspondent to the soul of man, and without which it would be a lifeless mass; while Substantialism teaches that the immaterial substantial forces of nature, though not intelligent agents, yet bear such relation to the earth that without them it would be as dead as the body of man without the spirit. Even if there should be a material element in each of them, yet if deprived of their immaterial forces, deadness to all physical things would be the result.

But why speak of light, heat and sound as having any material elements if they consist of mere "condensations and rarefactions"—mere motions, and mere motions being mere nothings? With materialists these nothings are very potent agencies, for without them the world would have neither *light* nor *heat* nor *sound*. All hail, then, to the god *Nihil, Non-entirety*, or whatever name they choose to give him, for if thought consists merely of disturbances of brain molecules, and if these disturbances are caused by exterior objects, that through waves—waves of light, say—excite the brain through the eye, and if the supposed waves of light are the mere motion of molecules of ether, how can such motion, such nonentities, have power to disturb the brain.

Suppose the vibrations of a powerful church bell does beat the air into rolling waves, there is no such physical force behind the reflected beams of the moon to jostle the molecules of the brain into such activity as when one for the first time sees its magnified mountains.

But if light is a substantial, immaterial entity, whether lunar or solar, it may have its own way of rousing up thought with or without molecular commotion and yet leave the soul with all its power to think just as it was after the exterior excitants have all died away.

Then how does the fact of memory harmonize with the molecular theory? If thought consists in molecular motion, and said motion is produced by external excitants, and if both motion and thought die on the removal of said

excitants how could said thought be held in memory? If thought consists in said motions how can it continue after the motions cease, unless there be some fixed, immaterial entablature upon which it is written independently of all flashy motions of whatever kind? These memories of former thoughts abide and recur in the darkness and silence of the night when there is neither sight nor sound to reproduce them, and if these thoughts consist of such motions, similar thoughts must consist of similar motions, but similar motions can be reproduced only by similar excitants, which under the changed circumstances all around are not likely ever to exist; and if so, the same thought never could be reproduced and consequently memory would be impossible. As exactly similar winds may not be expected to blow and produce exactly similar waves, so exactly similar sounds may not be expected to produce exactly similar molecular motions of the brain to reproduce the same thought as before, and if not what becomes of memory? Therefore, if mind, the foundation of thought, is not a substantial entity, with permanent abode in the incorporeal organism, neither memory nor record of the facts observed is possible.

If materialism had never been driven to the wall before, the first editorial in the September MICROCOSM ought to be decisive—a sample of the loftiest and most incisive thinking that touches bottom from beginning to end. With such facts and reasonings sown thick through all the ten volumes of Dr. Hall's Scientific Library, Substantialism can never die, and yet having won a distinguished place among the modern systems of philosophy it should have and must have a first-class college wherein its principles will be taught in all their fullness, and from which scientists of ability and culture will be sent out to carry on the work so triumphantly begun. It will need the strength and permanence which such an institution would give it. To many thousands in the field, Substantialism needs no further elucidation; but no great reformation either in religion, science, or government ever achieved a general acceptance in less than a generation. The public mind is so massive that a long time, much labor and great patience are needed to create a revolution, and it is hoped that the friends of the new truth will soon succeed in establishing a school worthy of the philosophy which is destined in due time to revolutionize the thought of the world.

Carthage, Ohio.

#### DR. SWANDER'S "SUBSTANTIAL PHILOSOPHY."

Let no subscriber forget that Dr. Swander is the publisher of his own book, and that all who wish a copy should send \$1.50 direct to Rev. J. I. Swander, D. D., Fremont, Ohio and receive it postpaid by mail. We trust that all Substantialists who wish their scientific libraries complete on this subject will send for this able work. Dr. Swander insists still upon giving one-half the amount thus received to us; but we insist upon not receiving another dollar, as the author is surely and justly entitled to the full fruits of the labors of his own elegant pen. At any rate, whether the benefit shall accrue to Paul or Apollos, send for the book and thus secure the chief benefit in the transaction.—Editor.



## DR. HALL'S HEALTH-PAMPHLET.

BY REV. J. I. SWANDER, A. M., D. D.

Our purpose in writing this communication is easily made known. Necessity has driven us to the work which we now undertake to do. Numerous letters have been received during the last three months from afflicted persons making inquiry after our opinion as to the merits of the hygienic discovery announced to the public by the founder of Substantialism. These letters have come in upon us from every afflicted point of the compass. The most of them are from invalids and sufferers from chronic maladies. A few epistles have been received from medical men, and one in particular from an M. D. who is known as a thoroughly tested substantialist, inquiring whether our substantial philosopher has not become an unsubstantial empiric.

At first we enlisted ourself in the cause of suffering and solicitous humanity, and began to answer the letters of our correspondents according to the limited measure of our knowledge concerning the matter to which these numerous inquiries related. We soon found, however, that we had undertaken more than we could perform. The correspondence increased beyond the measure of our ability. Our patience, time, stationery and stamps were imposed upon until we concluded to reverse the magnetic aphorism of Grover Cleveland and announce to the world that unjust taxation was unnecessary taxation.

Under this conviction we knocked our original purpose into "innocuous desuetude," and wrote to Dr. Hall for one of his health-pamphlets for the purpose of investigating the matter sufficiently to enable us to answer our correspondents through the columns of the MICROCOSM. This course we have adopted in the hope that the editor will be kind enough to give our communication to the public in the manner as above indicated.

Up to the time of sending for the pamphlet we had entertained no definite opinion concerning the merits of the discovery announced therein. We had, however, settled the following convictions in our mind, and in accordance therewith had freely expressed ourself to many of the correspondents who had sought our opinion of the claim as it had come to our attention through the MICROCOSM.

Our first conviction was that Dr. Hall was incapable of knowingly palming a worthless pretention upon a suffering class of a credulous public. We know that he could not possibly have any sufficient motive for such an undertaking. The great apostle of Substantialism is not built that way. The man who had made and kept himself poor that the world might become rich in the wealth of the Substantial Philosophy, was under the bonds of his own conscientious integrity of being, as well as the binding sanctity of his own immortal record in history, to continue in that noble and philanthropic course of life which involves greater riches than all the treasures of Egypt.

In the second place it appeared to us as a reasonable conclusion in the premises, that the man who had startled the world from its materialistic dreams by his radical discoveries in the philosophy of physics was by his trained habit of close observation not unlikely to make some correspondingly important hygienic discoveries that would lead him on and finally enable him to prescribe a rational and simple

cure for many of the maladies that human flesh is heir to, and also in a positive way give valuable directions for the preservation of health and consequent promotion of longevity.

In due time the health-pamphlet came to hand. The little book was immediately read with impatient curiosity and impartial care. The result of the perusal is a very favorable impression upon the writer's mind. We have had no occasion to test the treatment of which the pamphlet treats. Our health at present is nearly all that could be desired. For this we are largely indebted, under a kind Providence, to the salubrious atmosphere that we have found in the realm of the Substantial Philosophy, which we learned at the feet of Dr. Hall, and from which we have received and experienced some of those blessed incentives to new thought and hope, and which again have worked sympathetically toward a radical improvement in the health of our body.

Don't laugh, gentle reader, don't make light of us since we are no longer a grave subject. Let us get down to serious truth and substantial facts. Since the writer embraced the Substantial Philosophy he has gained twenty-five pounds as tested by a dozen pairs of honest scales. This increase is all normal and according to the standard avoirdupois pound of the United States. There is no apothecary's weight in the case. We have some faith in drugs; yet it is our deep and honest conviction that as a rule drug-medication can be rationally viewed as only a very poor atonement for sins previously committed against the majesty of Nature's laws, and liable at any time to reach its own ridiculous culmination in administering something like Dr. Brown-Séguard's procreative principle of the guinea pig.

By-the-way, how modest and rational Dr. Hall's claim appears in contrast with that of the French chemist who has recently thrown the world into a paroxysm of laughter by his announced discovery of the *elixir vitae* in the glands of a Brazilian rat! It is enough to disturb the equilibrium of an angel at prayer. If the last three months has produced any thing ludicrous, the scene lies in the recent conduct of Dr. Brown-Séguard armed with mortar and pestle and followed by some of the leading American medical men of "average respectability," chasing after the unmentionable parts of lambs, rams and rodents with which to drive age and illness out of existence, rejuvenate the race, and thus make room on earth for the vigor of undying youth, the paradise of perpetual pleasure and the bloom of perennial beauty.

There, gentlemen, you have quackery of the purest water on professional stilts, endorsed and practiced by the highest medical authority upon the planet. How different from this is the treatment as prescribed in the Health-Pamphlet. Tacitly recognizing the decree from heaven that it is appointed unto all men once to die, and submissively assuming that many are the afflictions even of the righteous, the prescribed treatment is intended and announced as only a help to nature in her constant effort to eliminate from the human system all adventitious principles and substances which, in the very economy of life itself, are apt to become germs of premature death, thus making it doubly strange that a harp of a thousand strings should keep in tune so long. The treatment is not only rational and unpretentious, but also most manifestly

in accord with the pathology of common-sense and the therapeutics of uncommon cleanliness.

It is needless to say in this connection that the many published endorsements of Dr. Hall's hygienic treatment by those who had made a practical test of its character, constitute a powerful array of unimpeachable evidence in favor of its merits as a reliable cure for, at least, some forms of disease. Surely these thousands of men and women are not all fools that they should be regarded as testifying in favor of some worthless pretention which has been palmed upon the people.

Gentlemen, it will not do to raise the cry of quackery in this matter. Yet such cry may probably be resorted to. Men have relied so long upon the healing properties of the diplomatic sheepskin, that some of them have finally located the fountain of life within the newly discovered ram parts of the regular profession. Out upon such contemptible narrowness of soul and limitation of inquiry. Knowledge is no longer confined to the self-constituted circle of the self appointed custodians thereof. That day is past forever. Its sun went down when the luminary of the Substantial Philosophy arose above the old materialistic horizon to shed its rays of broader, brighter splendor upon a new continent of more liberal and progressive inquiry after the real nature and necessities of human life.

In view of these facts we tender our congratulations to all parties interested in, and benefited by these recent discoveries. We congratulate the many thousands of beneficiaries who are now telling to sufferers around, what an effective remedy they have found in the application of this treatment. We also congratulate our friend, Dr. Hall, upon the fact that Providence saw fit to make use of his peculiar power and habit of close observation to supply a suffering world with a cheap and simple healing balm for so many of its afflicted inhabitants. May he live long before he is called to pass those pearly portals beyond which the laws of health are never violated, and where, as a result of obedience thereto, there is no disease, nor pain, nor sorrow.

As to the literary merits of the pamphlet, there can be but one intelligent expression of unbiased judgment. Written for the common people, the language is as free from the use of technical terms as the nature of the case would permit, and, at the same time, as free from false modesty as the vast importance of the subject required. The theme discussed is not one that incites the writer to the finest form of composition, neither is it of such character as to impel him toward the loftiest flights of rhetoric; and yet the style of the treatise is fully up to the author's reputation for ability to express himself in the use of the purest diction.

Fremont, O.

#### AN EDITORIAL ENDORSEMENT.

Some month or more ago Eld. John F. Rowe, editor of the *Christian Leader*, Cincinnati, Ohio, sent for a copy of our Health-Pamphlet, and now, after time for reading and testing, he says editorially among many other good things:

"We advise our readers to send an order for an Extra of the MICROCOSM, which, as conveying important medical information, will be of

immense value to them. Dr. Hall's Pamphlet on 'Health and Longevity' is taking the afflicted world by storm. He has discovered a remedy by means of which, without the use of drugs or medicines of any kind, the most obstinate chronic diseases may be permanently removed. The doctor is now seventy years of age. At the age of thirty he was given up to die with consumption. At that time he weighed 120 pounds; now he weighs 225 pounds, and bids fair to live many years longer, being strong and athletic. By his own wonderful discovery he has protracted his own life for forty years. We advise all who love to contemplate deep and far reaching subjects—such as substantial man is to be, outside of his material body—to subscribe for the MICROCOSM."

[The Extra MICROCOSM, referred to above, will be sent free to all who may desire it.—EDITOR]

#### THE SEVENTH VOLUME APPROACHING.

One more number completes this volume of the MICROCOSM.

We want to start off with the seventh volume with double our present list of subscribers if possible, and we believe our readers, by proper effort, can accomplish this result.

Subscribers may now commence renewing for Vol. VII., and with each renewal we hope they will try to send an additional name, at least, making an even dollar.

We hope further to receive with these renewals many good clubs of names, for which we will be very grateful.

Any subscriber or reader who will send us four new names (\$2) will receive his own MICROCOSM, Vol. VII., free.

We are glad to say to our readers that the future of the MICROCOSM is now financially assured, thanks to our many thousands of friends and patrons, and with this assurance Substantialism may now consider itself as fully established.

We are even now looking forward with more solid hope for the establishment of the College of Substantialism in the near future than ever before, and we confidently expect to make some very cheerful announcements in that direction before the next volume shall close.

EDITOR.

#### OUR HEALTH-PAMPHLET AND THE CLERGY.

Last month we made the special offer to the clergy of the country, who might have any misgiving as to the intrinsic merits of our health-discovery, that we would cheerfully send the pamphlet on one month's impartial trial, and would then refund the \$4 to any minister who should prefer the money to the new treatment.

This proposition was so fair and so conclusive as to the honesty of our own convictions concerning the value of the treatment that ministers by the score have been sending for the pamphlet ever since our announcement, not one of whom has up to our going to press, intimated a desire to abandon the treatment and receive back his money, but on the con-

trary all from whom we have heard express their gratitude that the Health-Pamphlet had ever been brought to their notice.

The drift of this feeling is well portrayed in the two additional pages of testimonials which we print in the present number. Let no one, who has the least doubt on the subject, send for the pamphlet until he has first addressed one or more of that array of indorsers, with return postage, and received a confirmation of his testimonial.

As this number of the MICROCOSM will be sent to many clergymen who did not see last month's issue, we transfer the proposition verbatim to this column as follows:

#### SPECIAL OFFER TO MINISTERS.

We have so much faith in the intrinsic merits of our Health-Pamphlet and the treatment unfolded therein, that we now propose to any *clergyman* who will order it at the regular price (\$4), and who will give the treatment a faithful test for one month, that if not satisfactory he shall have the privilege of returning the pamphlet and receiving his \$4 by return mail, without any reduction for our trouble and expense. This surely ought to satisfy the most skeptical and wavering.

But it is understood, that such minister must not only agree when ordering the pamphlet not to show it or reveal its contents outside of his own family, but must, if he returns it, send a like written promise never afterward to use the treatment or permit it to be used by his family.

Let no one hereafter say that we wish to obtain money from the purchasers of this pamphlet without giving full value for the same. Respectfully,

A. WILFORD HALL,  
23 Park Row, New York.

#### OUR HEALTH-PAMPHLET FREE TO THE POOR.

BY THE EDITOR.

Enemies of our work have accused us of mercenary motives in selling our Health-Pamphlet at \$4, when, as they insist, there are hundreds of poor and sick families who are not able to raise this sum under any possible circumstances, yet whose health and comfort might be restored could they have the benefits of this treatment.

To meet this charge, we now propose that any family who would not be able to procure drugs to the amount of \$4 if prescribed by their doctor, and who will get their nearest postmaster, after showing him this notice, to certify to the fact of such inability, we will send a pamphlet to such family free of charge in the care of the postmaster on receiving a written promise not to divulge the treatment or show the pamphlet outside of said household.

Those, on the contrary, who are able to pay for drugs which invariably leave the system the worse for their use, whatever temporary relief they may afford should not object to paying for this drugless prescription, which will not only serve them for a lifetime, but will make that lifetime much longer and much more enjoyable.

We wish also to repeat here what we have said before, that the money we are receiving from the sales of this pamphlet is not our own, except so far as we are its custodian, as it is sacredly set apart (all above expenses) for the cause of Substantialism, and for the founding of a college for the education of the deserving poor.

Let every friend of our Health-Pamphlet therefore feel, while he is making known its merits to his neighbors and friends, that he is

actually doing missionary work for the College of Substantialism and in the interests of true education.

A few persons have reprimanded us severely because we did not make known this treatment years before, or soon after we had made the discovery.

We have, however, already explained in the MICROCOSM our reasons for this delay, as set forth in the "Extra," a copy of which will be sent free of charge to rich or poor.

Our first reason was that we wished fully to demonstrate the value of the new treatment on our own shattered constitution for the permanent restoration and preservation of health without drugs of any kind, that we might be certain of its value and importance before formally making the announcement to the afflicted.

We wished also fully to test our own convictions as to the value of this treatment in the promotion of vigorous longevity before making it known in all the fullness of its advantages to humanity. This, of course, could only be done, with defined and determinate results, after a lapse of many years.

We, therefore, soon after the discovery had practically been inaugurated in our own person, determined upon forty years of scrutinizing experimentation on ourself, and incidentally on others, before venturing to publish the book which we had mapped out from the very start, and which has been superseded at least temporarily, by our condensed "Health-Pamphlet," as set forth in our "Personal Statement." (See "Extra.")

This long term of careful analysis having terminated with the most marvelous results upon our own organization upon which the undertaker thought he had a sure thing forty years ago, we resolved that we could now safely risk our hard-earned reputation, and know of a surety that in announcing the new treatment to mankind it would turn out no scheme of humbug guesswork, or professional empiricism, such as the recent Brown Sequard elixir fiasco proved to be.

We simply knew that what had lifted our own organization almost out of a consumptive's grave, and sustained it for more than forty years in robust health, required no doubtful hesitation or mincing of adjectives in proclaiming its merits and value to the world. And this conclusion the facts are already warranting in ten thousand grateful families in every state and territory of this broad land.

Indeed, had we publicly announced this treatment at the start, on our simple guess that it would prove a good thing for health and longevity, or without a practical demonstration of the fact, and without any previously established record on our own part for original scientific investigations in other directions, the whole thing would have fallen flat and the author would simply have been laughed at for his pains.

Even as it is, some of the learned "M.D.'s." have been affecting to laugh, but with a sorry sort of boomerang grimace as if something had hit them. The thing that has thus recoiled so unpleasantly is indicated in the following two pages of unimpeachable indorsements, — a mere ripple of the forest leaves as the precursor of a devastating cyclone of popular approval which is to inundate drug-medicine in the near future.

#### NOTICE TO LOCAL AGENTS.

☞ We have issued an edition of the "Extra" MICROCOSM, having no reference to our own business address anywhere in it, so that agents can use it exclusively in their own interest for general distribution, with their own address written or stamped on the margin. Free, except postage, — one cent per copy.

☞ We have also issued a large poster of similar character and on similar terms, for local agents to post up in stores, shops, hotels, etc., with their own name and address at the bottom. This poster is full of the best indorsements of our Health-Pamphlet from all sections of the country. Same copy sent free.



# STILL THE HEALTH-PAMPHLET TRIUMPHS.

The following two pages of voluntary indorsements of our new treatment without drug-medication, make *ten* that we have printed within the last five months, since the first pamphlet was sold. We could now print from our files *fifty* similar pages of testimonials without a single repetition, while dozens of new ones are being received by each mail.

Among the important recent indorsements is that of Dr. James F. Danter, of the College of Physicians and Surgeons, of Ontario, Toronto, Canada—formerly Magistrate in the Province of Quebec. So impressed was Dr. Danter as to the merits of the new treatment that on his way to his new field of labor in San Francisco, Cal., he purchased several hundred copies of the Health-Pamphlet to take with him. Writing to a friend in New York, September 10th, he says:

"I was among the very first to order Dr. Hall's Health-Pamphlet on seeing its announcement in the *Microcosm*. I was then in Washington City, and proceeded immediately to put the new treatment into practice personally and with others, more especially to test its physiological and therapeutical effects. I have become so well convinced of its value for the alleviation of many forms of disease, such as dyspepsia, lung troubles, constipation, kidney derangements, and in fact all forms of disease which have their origin in an impure state of the circulation, that I am ready to give it my unqualified indorsement. \* \* \* Jas. F. Danter, M. D."

Rev. Jas. B. Dibrell, of Seguin, Tex., writes, Sept. 19.:

"Dear Dr. Hall,—Please find inclosed check for ten more copies of your Health-Pamphlet. \* \* \* A great many from all parts of the country are writing to me to know if my indorsement, as published in the June *Microcosm* is genuine and if so, if I am still of the same opinion. You will save me lots of writing by letting your readers know that after using your treatment in my family and upon myself for more than three months, and in addition, after witnessing its marvelous effects on others, I am prepared to underscore and *italicize* that indorsement to the fullest rhetorical extent required. I hail this treatment as the greatest boon to sufferin' humanity which has been discovered during the nineteenth century."

"Truly yours, James B. Dibrell."

R. D. Dashiell, M. D., a prominent physician and surgeon of Princess Anne, Md., after using the new treatment to the improvement of his own shattered health, began at once recommending it to his patients. On Sept. 17th he writes:

"\* \* \* One of the pamphlets I ordered from you was for Prof. Bird, Principal of the Del. Conf. Academy. His report to me furnishes a very strong indorsement of your treatment. His condition at the time I recommended your treatment was very critical. He could not attend to his work and suffered from the most terrible headaches and general debility. A single week's use of your remedy had so much improved him that he was enabled to go on with his work, and he has kept at it all summer without fatigue, and with his full physical and mental capacity. As for myself, while my cough continues on about the same, my bowel trouble is greatly improved. I can now eat what I like, and I believe that improved digestion means improved assimilation and nutrition, and that gradually I shall keep getting better. I feel it my duty to recommend your treatment and to do all I can to disseminate your pamphlet in this community. Please send me a package of *Microcosms* and blank pledges for distribution."

"Very truly yours, R. Dennison Dashiell, M. D."

[Dr. Dashiell's trouble,—incipient consumption, as we learned from his first letter at the time he ordered our pamphlet, among the first that were sold,—was almost precisely like our own condition forty-one years ago. He need not, therefore, expect that his cough will entirely subside even for years, but with improved alimentation and nutrition, with a gradual increase of flesh and his blood kept pure, his lungs will entirely heal up, and he will, no doubt, become a robust and healthy man. All

he needs is a persistent application of this remedy, and he will always be thankful to Providence that he ever heard of it.—EDITOR.]

Dr. J. A. McKay, West Superior, Wis., writes, Aug. 19th.

"A. Wilford Hall, My Dear Dr.,—This morning I had a case which illustrates the value of your treatment. A man I was called to see at one of our hotels was found to be in awful agony with cholera morbus. I gave him the usual homœopathic remedy to be taken in teaspoonful doses, while I could make the necessary preparation for applying your remedy. I at once made a vigorous application of the new treatment, and soon after followed it by another. All pain had ceased before I was half through, and now, fifteen hours after the first application, he is well. \* \* \* This man assured me that he had two brothers who were taken precisely as he was, and that both of them died in eight hours in spite of all medical assistance and that he no doubt would have gone in the same way."

"Yours very truly, J. A. McKay, M. D."

Rev. M. L. Vorheis, of East San Jose, Cal., writes:

"I have been using your treatment four weeks and my kidney trouble, constipation and sick headache are gone. I am now preaching every night in the week and three times on Sunday, and with less fatigue than ever before during a ministry of nineteen years. \* \* \*

"Truly yours, M. L. Vorheis."

[By some sort of an oversight last month in the splendid indorsement of Robert Craig, of Bristol, Tenn., he was falsely located at Lebanon, Tenn. In his previous testimonial, in the July number, his address was given correctly.—EDITOR.]

Rev. A. Heald, Felchville, Vt., September 2d, writes:

"Dear Dr. Hall,—Inclosed send check for five more pamphlets which please find at once, as the parties who signed the inclosed pledges are waiting anxiously for them. \* \* \* I do not know of a single case where they have used your treatment in good faith, that it has not secured the highest commendations. \* \* \* In my absence from home I took a violent cold one evening at an entertainment, sitting in front of a raised window. Three days after I was suffering from a sore throat, with a severe cough, and with pulse above a hundred. I ached from head to foot, with every indication of a regular fever. I took one of your thorough treatments, and in thirty minutes there was an entire change in my system. The ache and pressure were all gone, a warm glow with a mild perspiration having taken their place. \* \* \*

"With many regards, I am, yours truly, A. Heald."

D. A. Wagner, Acton, Cal., August 14th:

"\* \* \* As I am somewhat known in Los Angeles city and county, I deem it my duty to report to you the effects of your treatment upon Mrs. Wagner, for the benefit of others afflicted who may read it. Your new discovery has wrought wonders in her case during the last six weeks, and I thought best to wait a little before reporting results. Suffice it to say, that all hope of her ever enjoying life again had been given up. For twenty years she had been a confirmed invalid, with constant suffering. But now, under the application of your treatment, she is free from pain and we have the strongest hopes of her complete restoration to health."

"Yours, etc., D. A. Wagner."

The distinguished pulpit orator and evangelist, Rev. Miles Grant, Boston, Mass., writes, October 7th:

"\* \* \* Touching your wonderful discovery I take much pleasure in saying, I am delighted with its effects upon my system. I sent for it that I might know its influence on a healthy person. I have now used it about three months, and intend to continue its use during my mortal life. The treatment produces a general refreshing invigorating effect,—sharpens my appetite, sweetens my sleep, and makes me feel as though I had a new lease of life. I have persuaded several of my brethren of the ministry to send for your Health-Pamphlet, and so far as I have heard from them they are exceedingly pleased. One of them said to me a few days ago, 'I would not take \$50 for it.—It knocks the bottom out of disease.' I can say for myself I never spent \$4 to better advantage than when I bought your pamphlet. Your brother in Christ,

Miles Grant."

Rev. Dr. S. C. Littlepage, M. E. C. South, Bastrop, Tex., sends his second indorsement, Sept. 7th, as follows:

"Dear Dr. Hall,— \* \* \* I have now been using your treatment for one month, and am in better health than I have been for thirty-five years. I feel it to be my duty to my fellow men not only to say this, but to use my best endeavors to make known your wonderful discovery by every means in my power. \* \* \* For the enclosed check send me six more pamphlets as soon as possible. Yours gratefully and substantially, S. C. Littlepage."

J. P. Bain, Hebron, N. S., writes, Sept. 13: "A friend of mine at a distance wrote me concerning a wonderful health-treatment discovered by you, and advised me to get it, knowing, as he did, the miserable condition I was in. I had him send for it for me, and immediately I began putting your treatment into vigorous practice, and now, after about three weeks, I am rejoiced to assure you that I already feel like a new man. I have been under the doctors' hands for the last sixteen years, from a complication of ailments too numerous to mention, including dyspepsia, bronchitis, and trouble of chest and lungs. I now believe that after all this suffering and outlay of money, I have found in your marvelous little Health-Pamphlet the true road to health. \* \* \* I now want the agency for this part of the British Province, if you will give me your terms and send me circulars; as I feel certain of success with my afflicted neighbors after such a wonderful change in my own condition as I can exhibit in so short a time. I was in a successful mercantile business but had to give it up on account of my poor health. I am now at your service. Send me terms at once. Yours gratefully, J. P. Bain."

Thos. E. Davies, Plains, Pa., writes, Sept. 17: "Dear Dr. Hall,—About a month ago I received your Health-Pamphlet, when I was entirely cut down with malaria and general bowel troubles. I made due application of your treatment as per directions in your pamphlet, and immediately my ailments began to subside, and now I regard myself a healthy man, and am rapidly gaining in flesh and weight. I regard it as my imperative duty to make known to others the great benefits I have derived from this simple remedy. I look upon your revolutionary discovery for the treatment of disease without medicine as only paralleled by your scientific discoveries which have so richly unfolded the substantial philosophy. I will do all I can for you in both these directions."

"I am, very gratefully yours, Thos. E. Davies."

J. Pettengill, Bar Mills, Me., writes, Sept. 16: "Dear Friend Hall,— \* \* \* Your treatment is simply wonderful. I have used the remedy but three times and the change is already such that I am now in better health than I have been in ten years. I regard you as a benefactor of your race, for having made known this wondrous remedy without drug-medication."

"Your very sincere friend, John Pettengill."

Mrs. Eliza A. Sprague, Reynoldsburg, O., writes, Sept. 16th:

"Dr. Hall, My Dear Sir—I received your Health-Pamphlet about one week ago, and after testing it words fail me to express the confidence I have in your treatment, even after its third application to myself. I can truly say that I have not known what health was for more than twenty years till since this little messenger of mercy has fallen into my hands, for which you will ever receive my gratitude and blessing. I soon expect to be in perfect health. And now will you let me act as agent in making known this discovery to my suffering neighbors and friends? If so, I will be glad to hear from you. Very truly yours, Eliza A. Sprague."

R. B. Dando, M. D., Alta, Iowa, who has sold some 30 to 40 pamphlets, sends his third indorsement, Sept. 3d, as follows:

"Dr. Willford Hall, My Dear Sir,— \* \* \* I have for many years been a great admirer of your scientific and philosophical writings, and hence was ready in advance to believe you had made a real discovery in therapeutical knowledge. Before receiving your Health-Pamphlet I had been afflicted for three years with what is called stultid dyspepsia. A single treatment with your efficient remedy removed the cause of all my trouble, and in ten days afterward I was once more a well man, and for more than three months I have not had a sick day. I consider yours a common-sense treatment for disease. \* \* \* Yours truly, R. B. Dando, M. D."

Rev. Dr. James A. Buck, a prominent Episcopal clergyman and chaplain of the Soldiers' Home, Washington, D. C., now well on toward eighty years of age, and one to whom we had revealed the new treatment before the Health-Pamphlet was printed, writes us Sept. 2d:

"My Dear Dr. Hall,— \* \* \* Please send me twenty copies of your 'Extra' Microcosm, all about your

Health-Pamphlet and your great discovery, as I want them to give to friends. I send you also herewith a list of names, to whom you can send copies. Should I come to the General Convention I hope to look you in the face and have some important talk. I am using your treatment and am *renewing my youth*; I think wonders of your Health-Pamphlet. May God bless you and give you a big reward for your discovery. Jas. A. Buck."

The Rev. Dr. Tilton, Milford, N. H., was among the earliest applicants for the Health-Pamphlet after its first announcement in the MICROCOSM. Mrs. Tilton was so much benefited by the treatment that she was enabled to visit her relatives in various parts of the state for the first time in years. She writes, Sept. 10:

"My Dear Dr. Hall,—I have just returned home from my trip to the northern part of the state. \* \* \* The great benefit I had derived from your treatment enabled me to speak a good word for it wherever I went. This was the first time I had been home for three years, and I can truly say that for many years I have not been able to travel in the cars with so much freedom from headaches and fatigue as on this trip. \* \* \*

Yours truly, Martha J. Tilton."

E. J. Morrison, M. D., Gun City, Mo., sends his fifth order for Health-Pamphlets, with \$10, and in each letter his enthusiastic indorsements of the treatment are renewed and reiterated in various wordings. Sept. 4th he writes:

"Dear Dr. Hall,—I have received letters of inquiry from various parts of this state and from Ill., Pa., Mich., Iowa, Neb., etc., asking concerning the authenticity of my indorsements of your treatment in the Microcosm. To all these I have replied, as I only could reply, in terms of the highest praise. My own health is rapidly improving under the steady application of that treatment, and although I am now constantly engaged in public speaking, my cough has entirely left me. My appetite and digestive powers are almost perfect, and I hardly know how to express my gratitude for this marvelous deliverance. \* \* \*

"Your grateful friend, Edward J. Morrison."

Geo. J. Whitelaw, Port Arthur, Ont., Can., writes, Sept. 2d:

"I am spending most of my time in the missionary work of spreading the news of your wonderful health discovery, as I am persuaded more and more every day that it is the very thing the people need in this age of drug-medication. \* \* \* My own health is improving so fast under your treatment that I am inspired to work in this noble cause for the benefit of humanity. My trouble was tubercular consumption, which is now gradually passing away; and my digestion is rapidly improving,—an evident sign of good health."

"Truly, Geo. J. Whitelaw."

Mrs. A. M. Weston, Riverton, Neb., writes, Sept. 3d:

"Mr. A. Willford Hall, Kind Friend,—I enclose \$40 for more of your Health-Pamphlets for our neighbors. My husband's rapid improvement under your treatment since the first pamphlet was received is causing many of the afflicted in the neighborhood to wish to obtain the pamphlet, as we are all tired of taking medicine. You have discovered a wonderful remedy. Another case also of great importance has just occurred, which causes much wonder—that of the infant of Mr. and Mrs. Shepherdson. Mr. S. came here yesterday forenoon and begged of my husband to try to do something for their babe if possible. It was seven weeks old yesterday, and has been sick ever since its birth, never having had one hour's quiet sleep, and never having had a movement of its bowels without exercising pain, and it was not expected to live but a short time. The mother was nearly worn out, having stayed up with the babe all last night. I took the case in hand and gave it two mild treatments during the day, and it went to sleep and only waked up once during the night, when we fed it, and it then slept on till morning. To-day it takes its food and sleeps as sweetly as any other child. Everybody near us expresses the greatest astonishment at the effects of your treatment on this babe, and I must own that both myself and my husband join in this astonishment. Yours truly, Mrs. A. M. Weston."

"What Mrs. Weston has written is literally true."

"Mrs. Shepherdson."

Rev. M. A. Smith, McAlester, Ind. Ter., who gave such a vivid description of his wife's recovery in the July MICROCOSM, now writes, Sept. 20th:

"Dear Dr. Hall,— \* \* \* My wife's recovery from consumption, wholly from the use of your treatment, has proved to be permanent. She is feeling well; her weight twenty pounds more than she ever did in her life. \* \* \*

Your grateful friend, M. A. Smith."

# The Microcosm

A MONTHLY JOURNAL OF SUBSTANTIALISM AND COLLATERAL DISCUSSIONS.  
THE ORGAN OF THE SUBSTANTIAL PHILOSOPHY.

**A. WILFORD HALL, Ph. D., LL. D., Editor and Proprietor.**

(Author of the "Problem of Human Life," "Universalism Against Itself," Editor of the *Scientific Arena*, &c., &c.)

**ROBERT ROGERS, S. L. A., Associate Editor.**

Address all communications to A. WILFORD HALL, 23 Park Row, New York.

Vol. VI.—No. 12.

NOVEMBER, 1889.

50 Cents a Year.

Entered as second class matter at the New York Post Office.

**Inconsistencies of the Motion-Theories of Science, No. 5.—Peculiarities of Wave-Motion.**

BY THE EDITOR.

The motion-theories of modern science, of which the wave-theory of sound is the type and the undulatory theories of light and heat are examples, have their formulated basis in the wave-motion observed on the surface of water.

Prof. Helmholtz, one of the foremost and profoundest physicists of Europe, repeatedly declares in his large work on acoustics,—the "Sensations of Tone,"—that the action of sound-waves in the air, is "precisely similar" to the action of waves on the surface of water. That is, as he carefully explains it, the air-particles oscillate to and fro as the sound advances, the amplitude of vibration becoming less and less as the distance increases from the sounding instrument, just as the amplitude of water-waves diminishes as the distance increases from their source.

Now, if the motion-theory of sound be true,—that is, if external sound really consists of air-waves instead of a substantial but immaterial form of force somewhat analogous to electricity, as Substantialism teaches,—then the view maintained by Prof. Helmholtz must hold good, and the oscillating action of the air-particles in the propagation of a system of sound-waves must be "precisely similar" to, and "essentially identical" with a system of waves produced on the surface of water. In other words, to change the logical sequence of the proposition and comparison, if the observed propagation of sound in air, according to the theory, shall be found essentially unlike and entirely dissimilar to that of the propagation of waves on the surface of water, then it follows that the wave-theory of sound is not true on its own basis of reasoning, and, therefore, that it must be fallacious in its mechanical and mathematical formulations.

There is nothing simpler and easier to show,

from observation alone, than that there is no sort of resemblance existing between the propagation of water-waves and the observed travel of sound in air. Let us for a moment look at the essential differences between the two classes of propagation, and thus see the absolute want of similarity and consequent absence of comparison as claimed by believers in the wave-theory of sound.

But first let us premise by saying that we, of course, deny in toto, and for abundant reasons as given in the first article in the August number of the MICROCOSM, that there are any such phenomena accompanying sound as the so-called "condensations and rarefactions of the air." Though at one time we conceded this fact to wave-theorists, we now deny in the most positive terms that the free air is disturbed in the slightest degree even for a single foot away from a sounding instrument of the most powerful vibratory action where no wind is used in causing the vibration.

Come, gentlemen of the motion-theory side of the house; the game of assumption in this matter has been played about long enough. Prove, if you can, that the sympathetically vibrating disc, the sounding string, the tremulous sand, or the dancing flame is thrown into action by air-waves of any kind, or forever after hold your peace.

We can prove, on the contrary, and have proved in the August MICROCOSM referred to, that these phenomena are caused by pulses of substantial but immaterial sound-force, and that air-pulses or so-called "waves of condensation and rarefaction" have nothing whatever to do with them.

But, for the sake of the argument upon the nature and peculiarities of wave-motion, we will for the present suppose that sounding bodies act on the air as the current science of acoustics teaches, that is, throw it into waves of "condensation and rarefaction;" and still we deny the foundation and rationality of the theory as based upon the claimed analogy existing between sound-waves and water-waves, and for the following reasons:



1. The velocity of water-waves is always in exact proportion to their amplitude of vibration; that is to say, their forward velocity of travel corresponds exactly to the depth of the trough or furrow between two waves; or expressed more technically, their velocity is in proportion to the distance from crest to sinus.

For example, start a system of large waves in a still pond by dropping a considerable boulder into the water, and these waves will be observed to move off with a speed precisely proportioned to their magnitude,—possibly fifty or a hundred times faster than will a system of waves started by dropping a small pebble into the same place. This is a matter of the most superficial observation, and a fact which we have demonstrated over and over as given in the "Problem of Human Life."

Now let us for a moment look at the essential difference between sound and this true wave-motion. *Loudness* of sound consists, as the wave-theory teaches, entirely in the amplitude of vibration, or in the width of swing of the air-particles as they oscillate to and fro while the sound-waves are advancing.

We need not stop to prove this teaching from the text-books on sound, since every authority on the subject, without exception, sets forth this fact (of the amplitude of the vibrating air-particles as the essential and only cause of loudness) as the fundamental principle of the wave-theory. But, when it is considered that all sounds, high or low, faint or loud, travel through air as a medium with precisely the same, uniform velocity, and that the so-called varying amplitude of the air-waves have no effect whatever on sound-velocity, the whole bottom at once drops out of the wave-theory, whether physicists are able to see it or not.

A superficial observer has only to listen to a band of music playing at a distance, to realize the fact that all sounds, soft or loud, high or low,—that is, that all so-called sound-waves, big or little,—reach his ear at exactly the same velocity, since precisely the same interval of time in the succession of the various notes occurs at his ear a quarter of a mile away as at the very feet of the musicians.

But suppose, for example, a dozen small canals to run side by side toward an observer stationed at one end, while a system of waves is started at the other end in each of the different canals simultaneously, each system to be of a different amplitude of vibration, and it is perfectly plain that the observer will note the time of the arrival of the waves or their rate of velocity to occur in the different canals in the precise ratio of their amplitude of vibration at the start. The largest system of waves will, of course, arrive first, the next largest next,

and so on to the smallest; while theoretic systems of atmospheric sound-waves of the smallest and largest vibrational amplitude, as just illustrated by the band of music, all reach the observer precisely at the same velocity. This manifest want of analogy, or this total absence of similarity between true wave-motion as shown on the surface of water, and the propagation of sound through the air, is alone sufficient to annihilate the wave-theory as set forth in all the books, and needs only to be mentioned utterly to confound a level-headed physicist.

2. The wave-lengths of any system of water-waves must bear at the start a stated and normal proportion to the amplitude of swing of the wave-particles, namely, about one to ten. That is to say, in all true wave-motion, the distance from crest to sinus, at the start of the system, is necessarily one-tenth of the wave-length or the distance from the crest of one wave to the crest of the next one following it.

But how is it in the case of sound? According to the wave-theory these atmospheric undulations have a supposed but unmeasurable amplitude of vibration, almost infinitesimal in all classes of sounds, high or low, soft or loud, while the so-called wave-lengths of different sounds are not only measurable but they vary from a few inches, in the higher notes, to twenty-eight feet in the low D of the double-bass instrument.

But here is where the great inconsistency of the comparison with water-waves comes in. This double-bass D, with an invariable wave-length of twenty-eight feet, may have any imaginable theoretic wave-amplitude or width of swing of the vibrating, air-particles, according to the degree of faintness or loudness of the sound produced.

Thus, while the wave-amplitude of this low D may theoretically vary to the utmost limits of imagination, its wave-lengths of twenty-eight feet must remain unchanged! In all true wave-motion, on the contrary, as observed on the surface of water, the slightest change in the wave amplitude, or in the height of the crests in any *given* system of waves, produces a corresponding change in the wave lengths, keeping them in the invariable proportion of one to ten. In other words, while the true wave-lengths of a given system on the surface of water must always be about ten times that of the wave-height, the theoretic wave-lengths from the low D of the double-bass,—always twenty-eight feet—vary from 16,000 to 3,360,000,000 times that of the theoretic wave-amplitude, as we shall show before we close?

To compare the theoretic wave-lengths and wave-amplitude of sound with the true and

observed proportion of wave-length and wave-amplitude on the surface of water, is sufficient to destroy the wave-theory of sound at a single blow.

3. If sound is propagated by true wave-motion in any manner resembling water-waves, then a sound started in air should become higher and higher in pitch and go slower and slower in velocity the farther it travels. This is exactly what takes place on the surface of water, since these waves as demonstrated travel slower and slower just in proportion as they become reduced in height, and thus get nearer together, thereby diminishing their wave-lengths (which represents higher pitch in sound) as the distance from their source increases.

Thus all sounds should become higher (shorter wave-lengths) and travel slower the farther they recede from their source if there is any foundation for the wave-theory of sound as based on water-waves. But here again the bottom drops out of the wave-theory, since all sounds in air whatever their wave-length or theoretic wave-amplitude, travel at one uniform rate of velocity and never rise in their pitch from their start till they entirely die out.

If sound-waves, as Helmholtz teaches, are "precisely similar" to, and "essentially identical" with water-waves, then as a matter of scientific necessity these pretended air-waves should get closer and closer together (higher in pitch) and travel slower and slower the farther they advance from their source, since this is exactly what occurs in the propagation of water-waves. Thus again does the comparison of so-called sound-waves in air with true wave-motion on the surface of water wipe out the current theory of acoustics by mechanical and mathematical demonstration.

To show that the claimed amplitude of vibration in atmospheric sound-waves is all supposition and guess-work, mainly to help make out a case for the theory even with its contradictory showing, it is a fact that no two physicists, even of the highest authority, come anywhere near agreeing in this supposed amplitude of vibration in atmospheric sound-waves.

For example, some time ago Dr. Mott wrote to two of the most prominent physicists in this country asking them to state the amplitude of a sound-wave at its greatest vibration and also the smallest vibration of the air-particles that can produce audible tone. One of these professors answered: from the one-fiftieth to the one-millionth of an inch; while the other as gravely replied: from the one-two-hundredth to the one-millionth of an inch.

Both, it seems, agreed upon the one millionth of an inch as the minimum limit of vibration

of the air-particles that would produce audible sound, though differing as to the amplitude of vibration at the start.

Now if this statement of the best authorities in this country is to be relied upon, we will prove in just one minute from undeniable figures that no sound ought to be heard twelve feet away from the loudest sounding instrument. Prof. Tyndall, in strict accordance with the theory, teaches that sound decreases in loudness as the square of the distance from the centre, and that the vibratory motion of the air-particles also and necessarily decreases at the same ratio. ("Lectures on Sound," page 10. See our quotation of his statement in full, "Problem of Human Life," page 152.)

This being the law of sound-decrease and of atmospheric motion, according to the wave-theory, let us see how soon a given sound ought completely to die out so that it could not be heard at all.

Suppose the ear to be stationed one inch from the sounding instrument and that we give the theory the benefit of the largest vibration of the air-particles claimed by science as obtained by Dr. Mott,—one-fiftieth of an inch; what should be the amplitude of vibration for example, at a distance of *two inches*, according to this law of squared distance inverse? Manifestly the air-particles should move but one-fourth as far, or but the one-two-hundredth of an inch. At three inches from the sounding instrument the air should have but one-ninth the motion or but the one-four-hundred and fiftieth of an inch. At four inches away from the sounding body this motion would be reduced to one-sixteenth that at the ear, or to one-eight-hundredth of an inch. At ten inches away, the air of course would vibrate but the one-five-thousandth of an inch; and at twelve feet away, the vibration would be reduced to the one 1,036,800th of an inch; and thus the loudest sound would totally die out in twelve feet from the instrument, even giving the theory the benefit of the largest estimate of air-vibration its advocates dare claim.

We cordially invite any professor of physical science in any college in Christendom to go over these figures and obtain a more favorable showing for the theory than we have given it.

Assuming external sound to consist of the vibration of air-particles, instead of the substantial but immaterial pulses of sound-force as set forth in the Substantial Philosophy, and it is mathematically demonstrated that no sound on earth can be made loud enough to be heard a single rod from the sounding instrument.

The ablest advocates of the wave-theory either do not see any necessity of reconciling the theory with itself, or else its inherent in-

congruity is such that they regard the task as hopeless. We should greatly like to see some Helmholtz, Lord Raleigh, or Sir William Thompson tackle some of these molecular and motion problems and try to bring order out of the contradictory confusion. No wonder that Tyndall, in one of his unbiased moods, should declare :

"Assuredly, no question of science ever stood so much in need of revision as *this of the transmission of sound through the atmosphere*. Slowly but surely we mastered the question, and the further we advanced the more plainly it appeared that our *reputed knowledge regarding it was erroneous from beginning to end.*" *Lectures on Sound*, 3d Ed., p. 328.

Why, then, after this frank confession of incoherent bewilderment, should Tyndall sneer at us because we oppose the theory which has resulted so unsatisfactorily as well as so disastrously to his "reputed knowledge?" Surely Substantialism offers a solution of the whole problem which tells plainly, and without the least contradiction, why this "*reputed knowledge was wrong from beginning to end.*" Let physicists accept its solutions and the above described self-contradictions will cease.

But we have not reached the end of these absurdities. This atmospheric-vibration theorizing and guess-work, out of which has grown the so-called "condensations and rarefactions" constituting sound-waves, is as full of discrepant elements as a mustard-pod is full of seeds. In fact the fundamental assumption of the propagation of vibrating air-pulses, as just hinted, is made up of incongruities from the time they are supposed to leave the vibrating fork or string to the very limit of sound-audibility. Let us briefly look at a few more specimens of this want of scientific consistency.

It is claimed that air-pulses, as they pass off to a distance from the sounding instrument, and which constitute *sound* external to our sensations, partake of the same simple harmonic to-and-fro vibrations as those of the fork-prongs themselves, and that the air-molecules thus started into vibration transmit the pulse by hitting the particles in front, these in turn hitting the next, and so on as far as the sound is propagated. In fact this elementary explanation constitutes the last analysis of an air-pulse or a so-called sound-wave, and if this reasoning can be overturned on purely mechanical principles it must of necessity destroy the wave-theory. Let us now once for all, wipe out the theory by showing that such air-pulses in the very nature of physical law can not travel with uniform velocity from the start, as sound is known to travel to the boundary of its audible range, and consequently that sound is not and can not be constituted of such supposed air-pulses.

How is this to be effected? We answer :

1. As the amplitude of swing of the vibrating air-particles constitutes the loudness of the sound according to the theory, it follows that this distance of swing must get less and less as the sound grows fainter and weaker. 2. As these supposed vibrations of the air-particles, like the vibrations of the prong, are simple harmonic motions like those of an isochronous pendulum, that is, occurring in uniform periodic succession, it follows that the smaller and smaller travel or swing of these air-particles must make their velocity of travel, like that of the prong itself, less and less in like proportion. 3. As the velocity of these air-particles becomes less, it will take them longer to reach and to hit the particles ahead of them, these the next, and so on, since the theory tells us these air-particles do not normally touch each other but are many times their diameters apart. And 4, since the distance of travel of the air-particles becomes less as the sound advances; and since their velocity of travel becomes less in like proportion, being isochronous; and finally since their collisions with those in front in a given time become correspondingly less in number and strike with less force, thus in turn driving those ahead of them with less and less velocity, it follows by the undeviating laws of mechanics that the pulse itself, consisted of these oscillations and collisions, must also travel slower and slower the farther it advances.

But now comes the culmination of the argument: As sound is known to travel with unvarying velocity from its start throughout its entire audible range, it follows as an absolute mechanical and physical demonstration that sound is not constituted of air-pulses or of atmospheric "condensations and rarefactions" as the wave-theory teaches, and consequently that the whole scientific world is mistaken concerning the true theory and nature of sound.

We ask every candid investigator, and especially those professors of physics in our colleges and universities who are not governed by prejudice, to go carefully over these analyses of wave-motion and pulse-composition in the light of the wave-theory and see for themselves if it does not completely destroy that theory.

Indeed, if the propagation of sound depends, as the wave-theory teaches, upon the molecules of air started by the vibrating prong or string hitting those in front of them, these hitting the next, etc., what certainty can there be for the regular advance of such supposed pulse when the air molecules, according to the molecular theory, are many times their diameters apart and travel in varying directions more



than one thousand feet a second? In fact, when the prong is known to travel at a velocity of only *one inch in two years while still sounding audibly*, as demonstrated by Captain Carter, what certainty is there of a molecule being hit (?) at all? If any *hitting* takes place it would rather be the molecules of air, in their supposed everlasting bombardment, hitting the prong which stands comparatively still!

But the subject expands as we advance, and we must wait for the coming volume. (See MICROCOSM, Vol. III., page 154 and onward.)

**PRIZE ESSAY, No. 31.**

**Substantialism the Solid Basis of a True Philosophy of Life and of Mind.**

BY GEORGE HARPER, A. M.

In all ages, from the earliest dawn of speculation, the reflecting mind has ever felt an irrepressible desire and ambition to comprehend the true relationship which the individual bears to nature and to a Supreme Being. Such a noble aspiration would seem indeed to have occupied the thoughts and filled the hearts of the wise and good of all nations and of all times. But from a philosophic point of view the history of past failures in this respect has proved that much had to be done before a satisfactory solution of so profound a problem could properly be arrived at. It is found that, in the domain of physical science, a very considerable advance had to be made before the true philosophy of mind and of life could be established on a firm and enduring basis; and this because such a solution must of necessity rest upon a basis of true science. And, indeed, we find that for want of such a necessary basis the whole history of philosophy is but a melancholy record of signal and successive failures in this direction. And taking a rapid glance at the field of natural science as taught at the present day in all of our schools and colleges, we are forced to the conclusion that much of it is false and untrustworthy. Hence, if it is thus true of a considerable portion of accepted science, it naturally follows that the conclusions which have been reached relative to the problem of life and of mind as correlated to such science must be equally unsatisfactory.

Nor must the fact be overlooked in this connection, that not every scientist, however much of an expert in his own particular department, is necessarily likewise an adept in general philosophical inquiry and speculation. Such a Baconian capacity seems to belong to another order of mind, higher and more comprehensive, that can hold in its lion-like grasp the leading truths not of one but of many sciences and determine their true relations to each other. Now the founder of the Substantial Philosophy, although having no name as a formal scientific investigator, by simply occupying the vantage ground of a wider generality has been able, oftener than once, to teach refractory scientists a lesson in their own specialized fields which some of them are not likely soon to forget.

It need hardly be said here that the chief aim and end of all true philosophy is to lead us to a correct solution of the vexed problem of life, and thus to enable us to deduce a knowledge of our responsibilities and duties. Now by the happy advent of Substantialism, a new

and brighter era has been inaugurated, and philosophy has at length discovered additional arguments in relation to man's condition here, as well as further proof of his probable existence hereafter. Such a noble achievement the author of the "Problem of Human Life" was able to accomplish mainly through a superior knowledge of the interdependence of the sciences relating to mind and matter.

In his preface to his profound and masterly treatise referred to above, the author informs us that for many years it had been the main ambition of his life to discover such additional arguments as tend to strengthen and confirm the Scripture doctrine of immortality. And, indeed, it seems but reasonable to suppose that if man continues to live as a conscious being after death there must be some available proof of it in the realm of science and philosophy in addition to Bible testimony. From no part of the wide domain of nature, animate or inanimate, is the truth upon this subject plainly manifested. The lordly eagle does not scream it from the frowning cliff, nor the cow low it from the green meadow; nor the tuneful lark, to heaven's gate soaring, warble it in our rapt ears; nor does the vivid lightning, with pen of fire, flash it, however briefly, on the rolling storm-cloud; in short, it is not seen or heard in any of the endless sights or sounds of nature. Yet may the unconquerable mind of man, by the right use of reason, essay the solution of the mystery.

Inspired by such a laudable and comprehensive design and through the hard tasking of his best powers, the founder of Substantialism has accomplished the noble task before him in a most complete and satisfactory manner; at the same time that he has succeeded in throwing much new and interesting light upon various branches of natural science. The same praiseworthy ambition to strengthen and confirm Christian faith, through the channels of science and philosophy, has at all times engaged the serious attention of earnest and able thinkers, as we find in such works as the "Religio Medici," of Sir Thomas Browne; and subsequently, in a similar work inspired by it, entitled "Religio Chamici," by the lamented Prof. George Wilson, a distinguished teacher of technology in Edinburgh University.

In glancing over the contents of any treatise on the history of philosophy, one can not fail to be struck with the evident signs of pure guess-work in much that is presented. In brief, all seem to be alike marked by the want of a proper basis on which to erect a trustworthy scientific or philosophical superstructure. Nor are even the greatest names any exception to this remark; for we find that even Spencer, when he leaves his chosen field of *data*, and betakes himself to the cloud-capped towers of metaphysics, he fares no better than the rest, for want of the magic key which has been found in the philosophy of Substantialism.

We thus find that outside of the new philosophy no one has yet discovered an unfailing guide to the solution of the dark problem involved in life and of mind. The Rev. Joseph Cooke divides the universe into two departments, namely, mind and matter. Col. R. Ingersoll assumes that matter and force constitute all there is of God, and that mind or thought can only act through or within the brain. Following the great infidel, is a large class of modern writers, mostly scientists, who

maintain that mind is not a positive entity but a mere quality, holding that brain secretes it, and that it could not exist without a material instrument through which to manifest itself. Such rash thinkers resolve man into a machine, and the operations of his mind into nothing more than the motions of a mechanism with which he himself has nothing to do; in short, they materialize even the very sentiments and emotions of man, and make them dependent on certain nervous and molecular activities. In striking contrast to all this is the simple yet comprehensive classification of the new philosophy which clearly demonstrates that, at the last analysis, there is but one entity or universal substance, and that all things else that can be said to exist are but subdivisions of this one.

In all his original researches and criticisms, like another Franklin, before accepting as true any doubtful fact or questionable hypothesis, Dr. Hall has first of all made rigid inquiry with the query—"But is it so?"—a method of severe scrutiny which seems to be greatly needed at the present day, when so much that passes for science and philosophy is mere assertion without sufficient proof. It was this spirit of stern and relentless investigation that ultimately led to the important discovery of the fallacy of the wave-theory of sound, which has proven to be the key to the solid and majestic arch of Substantialism. Thus has mind itself been shown to be a substantial though immaterial entity, belonging to the same category as heat, light, magnetism, electricity and other phenomena-producing causes; but to do this successfully, it was first necessary to overthrow current theories from which an opposite conclusion could easily and logically be deduced. The phrase "modes of motion," so much juggled with by incautious scientists, is thus shown to be a mere blind to cover up ignorance or inattention. In short, by this profound and all-embracing philosophy, whose ramifications are wide as the universe and comprehend and penetrate all science and all knowledge, the little world within, and the great world without men are completely harmonized like perfect music unto fitting words.

In fine, it was this spirit of severe investigation, so characteristic of the true philosopher, which has enabled the editor of this journal to correct not a few serious errors which had crept into the magic circle of accepted scientific theories. And like all other conspicuous disturbers of the scholastic peace of the world, the patient doctor has been exposed to the usual amount of odium and vituperation. But it is gratifying to know that after the smoke of the preliminary battles has cleared away, Substantialism rests upon a basis of rational truth, and truth, moreover, easily comprehended by the common man. And a foundation being thus securely laid, a superstructure of magnificent proportions may now be raised thereon such that, while its mighty pillars of truth rest firmly upon earth and all that it contains, its lofty pinnacle reaches up to the highest heaven and falters not till it rests securely against the footstool of the Eternal.

Anchorage, Wis.

Remember that this is the closing number of Vol. VI. Those who want Vol. VII. should send their 50 cents at once, with as many new names as possible. See fuller notice elsewhere.

### The Real, or Substantial in the Forces of Nature and in the Spiritual World.

BY J. W. LOWBER, PH. D., LL. D.

Number III.

The following articles are a condensation of a chapter in the author's new book, "The Struggles and Triumphs of the Truth."

I will now, at some length, call attention to one of the forces of nature which has been a special study with me for several years. It is that wonderful force called magnetism. There is an old story, that a shepherd once laid down his crook by a stone, and when he lifted it up it stuck fast to the rock. This is doubtless a legend, but it is quite certain that the Greeks and most of the ancient nations knew that the loadstone attracted iron. A piece of loadstone is called a magnet, from the Greek *magnes*, because it is supposed first to have been found in Magnesia, in Asia Minor. A piece of iron, rubbed on a loadstone, becomes itself a magnet and it will attract other pieces of iron. A peculiarity in a piece of magnetized iron led Gioja to his inventing the mariner's compass. He learned that a magnet, when suspended by a string, would always turn so that one end would point to the north and the other to the south. He then tried the following experiment, which proved a complete success: He placed a magnetized needle upon a round card marked north, south, east, west; he fastened the card to a piece of cork and floated it in a basin of water. Whichever way he turned the basin, the needle turned the card, and pointed north and south. Thus was invented the mariner's compass.

There has been much dispute as to who first invented the compass, for it was certainly known to the Chinese in early times. It is generally agreed, however, that Gioja invented it independently, and that he was the first to make a practical use of it in navigation. It was a great invention, and did much to advance modern civilization. In early times, sailors were guided entirely by the stars; as these lights could not always be seen, they had to keep near the shore. The compass has entirely obviated this difficulty, and now they can sail the roughest seas, and when in a storm it is better to be far away from land than near it. The briny deep is literally covered with ships, and the commerce of the nations is carried to the most distant parts of the earth. Christian nations have reached nations that were for centuries entirely isolated. God has thus prepared the way for the evangelization of the world. Magnetism, the mysterious and substantial force of nature, is thus God's agent in enlightening and elevating the nations.

The nature of magnetism is not generally understood. Some regard it as a mode of molecular motion; but molecular motion is a fiction in science, and more difficult to understand than magnetism itself. There is a close relationship between magnetism and electricity, but magnetism differs from electricity in the fact that it produces no direct effect upon our senses. We only know its effects by the way it moves other bodies.

A careful study of magnetism has convinced me that it is one of the immaterial substances of nature. I believe it is generally admitted that no material substance can pass through platinum or glass; yet these substances are no barrier to magnetism. A magnet may be

corked and sealed in one bottle; iron filings may be placed the same way in another, yet the magnet will attract the iron. This experiment teaches us that magnetism has a very close relationship to the spiritual. May it not yet be the means of solving the difficult problem of the relation of the spiritual to the material world? All interested in this subject should obtain a large magnet and experiment at their leisure.

In a future article, I will speak of the substantial in the spiritual world, but will close this article in the following lines of the poet:

"That power which, like a potent spirit, guides  
The sea-wide wanderers over distant tides,  
Inspiring confidence where'er they roam,  
By indicating still the pathway home  
Through nature, quickened by the solar beam,  
Invests each atom with a force supreme,  
Directs the caverned crystal in its birth,  
And frames the mightiest mountains of the earth;  
Each leaf and flower by its strong law restrains,  
And man, the monarch, binds in iron chains."

#### PRIZE ESSAY, No. 22.

##### MATERIALISM.

BY REV. J. R. PRIOR.

Materialism teaches that matter is the only existing substance, that originally it was entirely simple, that it was destitute of life and that from this simple and lifeless substance come all life and intelligence.

Now, I propose to show that this theory is fundamentally erroneous and absurd. The necessary characteristics of matter are not such as can account for the phenomena of life. There is no similarity or analogy between matter on the one hand and life on the other. They are entirely unlike and the one can not become or produce the other. The fundamental characteristics of life and intelligence are not only different from but infinitely superior to anything in matter.

Matter may properly be defined as some kind of substance whose necessary qualities are extension and form, as body and inert or entirely passive, that is, having no power to act in and of itself, as lifeless substance having extension and form and perhaps color of some kind. Matter is composed of atoms or ultimate particles. Whatever it be in its very essence of nature it must as body be in some way made up of atoms or ultimate particles. That is, there must be such elements of which matter, as it appears or body is constituted. Matter has no life and so can not produce it in any form. What is called *living* matter is more than matter. It is *matter and life in some way associated with it*. Matter alone, matter itself, has no life, whatever it may be in other respects. Such is matter as it is in itself, that is, matter stripped of every characteristic that does not properly or necessarily belong to it.

Considering, now, the atom as it lies before us, turning it over and viewing it carefully from every point and we have, by hypothesis at least (and we shall see that the hypothesis is true in fact), only substance having extension and form but destitute of life and incapable of self-action. As it is with one atom so it is with every other or any number, each and all having the same nature. Each one being only a lifeless form it has no power to act and so with others singly and combined. The combination of these particles can add no new principle or give any additional power, and all together are as lifeless and powerless as any one taken by itself. No combination or varied

arrangement of lifeless atoms can produce life or be any nearer life than one lifeless atom alone. If the particles are not simple or all alike but different, this only serves to render the condition still more varied with the same lifelessness. There would still be no approach to life. Variety of combinations and multiplicity of parts and motions avail nothing. *One lifeless particle in motion one moment is as near life and intelligence as millions in motion millions of ages.* Variety of combination and duration and motion are not life and can not become or cause life.

Now by an examination of what is called spontaneous-generation it will be seen that the definition of matter herein given is not too narrow and does not deny to it any essential quality but allows it all that materialism can properly claim, and that the above hypothesis is true in fact, and also that spontaneous-generation includes all there is in materialism.

What now is the theory of spontaneous-generation? What is its distinctive peculiarity? A careful examination will show that this theory is that life arises spontaneously from a lifeless substance called matter. According to this theory all life comes from this one source alone. The theory has no claim, there is no meaning in the term, upon any other ground. The whole theory centers in and depends entirely upon this notion. Its one distinctive peculiarity—that which renders this theory what it is and distinguishes it from all others regarding the origin of life,—is that life bursts forth from that which before had no life and without help from any other source. This alone is spontaneous-generation. Now it is evident that spontaneous-generation must be either (1) life already existing and manifesting itself or beginning to act in a given way, or (2) life coming from or originating in that which before had no life. It can not be the former for there would be no distinctive claim in that. It can not be the latter for that is absurd. Thus the theory of spontaneous-generation is seen to be absurd and the fallacy of materialism is seen in its identity with it, for materialism depends upon and involves spontaneous-generation. It can claim no more and is really another name for the same thing. Hence the real question involved in materialism is that, that which has no life and intelligence, that is, that lifeless particles of matter do produce all life. This alone is the theory of materialism.

The materialist can not claim that there is life within the matter and that it suddenly manifests itself in a particular way. This would be giving up the question, for by life being within matter must be either (1) that it is dependent upon and grows out of its changes and the varied arrangement of its particles, or (2) it must be something independent of all such changes and arrangements and only associated with and using matter. It must be one or the other of these hypotheses. It can not be the former for that would be absurd. It can not be the latter without giving up the theory for this second hypothesis, is that life is something independent of and that uses matter.

Materialism is, therefore, fundamentally erroneous in that it is an attempt to account for life without life, an attempt to produce life through the varied arrangement and motion of lifeless particles of matter and that without any power to produce the arrangement and give the motion. But the life must cause these



varied phenomena and not these the life, and so must exist before and independently of them. These changes are the effect and life itself the cause. To suppose otherwise would be to put the effect for the cause by assuming that life produces these and at the same time is the effect of them. Whatever changes the material particles undergo the life must remain and be independent of these changes and the cause. There must be life and intelligence as the cause and independent of matter and not something growing out of the varied relations and motions and changes of the particles of matter. There must, therefore, be something besides matter. There must be immaterial physical and spiritual substance existing in and of itself, and to the latter of which all life and intelligence belong. In this way alone can we account for the varied and wonderful phenomena of universal existence. Hence Substantialism naturally takes its place as the true and only comprehensive philosophy of the universe.

Provincetown, Mass.

### HEROIC DRINKING OF WATER.\*

BY THE EDITOR.

Among the various claimed methods of curing disease that have had their run and their enthusiastic advocates, is that of drinking copious draughts of warm water, thus to wash out the stomach and rinse its contents through the *duodenum* into the small intestines by the force of this flushing process. It is claimed by the advocates of this method of treatment that by its means constipation can be counteracted and dyspepsia can be cured; and that the overplus of water, not absorbed through the walls of the stomach, will mechanically reach the colon and thus dissolve and wash away its contents.

We have received several statements from persons who are in the habit of administering these heroic draughts of water for the diseases named, who declare that they have frequently caused the patient to drink a gallon within five minutes from the time of putting the pitcher to the mouth. And as the stomach will contain but little more than a quart, it is evident that three quarts of this water must pass on down the intestinal canal, thus reaching the colon before absorption into the system, to any extent, can take place.

We have frequently also been asked by correspondents, when writing to us concerning the nature of our new treatment for disease, if it consists of this process of heroic drinking of warm water. Our invariable reply is *no*.

Further, we are asked if we approve of the

treatment. We answer in like manner *no*, and for the following reason: The stomach is nature's laboratory for organisms of all kinds, charged with a chemical and vital secretion of a character almost as precious as the blood itself, namely, the *gastric juice*, whose office is to digest our food and fit it for absorption, assimilation and nutrition. It is perfectly evident that such heroic flushing of the stomach, with this rinsing of its contents mechanically into the intestines, necessarily carries with it the gastric fluid, thus unfitting this laboratory for the chemical and vital treatment of new food that may be admitted.

This process of washing away the vital gastric fluid with the unwholesome contents of the stomach, while it may render a temporary relief, similar to the action of various drugs, it must necessarily leave the physiological condition of the stomach worse in the end, as it will cause a serious and deleterious drain upon the entire organism for the secretion of extra gastric juice to take the place of that wasted, and to carry on the work of digestion even in a deteriorated degree.

It is somewhat similar to the pernicious habit of tobacco-chewing which causes a constant waste of saliva in the shape of repulsive and continuous spitting, thus causing a corresponding but less dangerous vital drain upon the system.

The washing of the gastric juice mechanically from the stomach down into the colon may temporarily counteract constipation and start an action of the bowels by causing a re-digestion of the solid excrementitious obstructions. But as in the case of powerful cathartics the temporary benefits thus derived from washing out the stomach are more than balanced, as before remarked, in the tax it imposes by a drain upon the general organism.

It was this irrational waste of the gastric juice in the unreasonable and almost heathenish "Thomsonian system" of interminable *Jobelia* emetics which the writer endured in his early manhood, and which finally led to his emaciated condition thereby forcing him into the discovery of his new remedial system of treatment.

An emetic should never be administered or taken except to remove from the stomach some very dangerous substance accidentally swallowed, for the very reason here given, the vicious waste it produces both of the digestive fluid and the saliva.

No; this is no part of our system of hygienic treatment which we were so fortunate as to discover nearly forty-one years ago, and which raised us from the condition of a helpless consumptive to our present robust health, with an avoirdupois of 225 pounds of solid structure.

\* This article contains the substance and the essential phase of one of the closing chapters of our large book on "The Art and Philosophy of Great Longevity, or How to Attain Vigorous and Youthful Old Age," which has been temporarily superseded by the publication of our "Health-Pamphlet." These digests of chapters will be continued in next volume of the *Microcosm*.

If we had no more scientific, philosophical and rational system of treatment to offer to the afflicted than the deleterious heroic drinking of water, by which to wash away and waste the precious fluid which prepares and conserves all the nutrition of our organism, the reader can depend upon it that our "Health-Pamphlet" would never have seen the light.

# ERRORS IN CONFLICT.

BY J. I. SWANDER, D. D.

The *Magazine of Christian Literature* for October contains a reprint of some able and interesting contributions to the general fund of the world's erudition. Among these are papers by Henry Wace, D. D., Principal of Kings College, London, and Prof. Thomas H. Huxley, the great English evolutionist. As many of our readers have already made the acquaintance of Mr. Huxley in their perusal of the "Problem of Human Life," they will possibly be glad to learn that the professor is still alive, and that his Orohippus is doing as well as could be expected, considering the critical and merciless investigation through which the animal was obliged to pass in Dr. Hall's "Evolution Evolved."

The discussion between these English giants was on the subject of "Agnosticism," and it naturally carried the disputants into the sphere of religion, and lead them along the border of that supernatural realm of being concerning which the agnostics confess themselves and charge everybody else with being absolute know-nothings.

The merit of this notable discussion consisted largely in the fact that both parties engaged therein allowed themselves to come into the most direct conflict with each other concerning the person of Jesus Christ, his revelation of himself to the world, and the extent that such revelation justifies the confidence of Christian faith, as well as the inductions and deductions of human reasoning in the realm of religion.

The fact noticed in the foregoing paragraph, shows that there is a claim on the one side and an involuntary concession on the other that Jesus Christ, whether he be a real or mythical character, divine or merely human, is the key to the world's history, and necessary to the satisfactory solution of all those difficult problems involved in the nature and destiny of man.

But while these two great scholars and debaters seem to have a common understanding as to the proper, central position in their arena of disputation, they differ very widely both as to the authenticity of the gospel narratives and the manner of arriving at the true value of their solemn attestations. Dr. Wace affirms that the latter "is in a vital respect an appeal to experience, and so far to science itself." Prof. Huxley replies that "it is strictly a scientific problem capable of solution by no other methods than those practiced by the historian and the literary critic."

As further specimens of intellectual pugilism in the London prize ring, we note and quote the following. The Principal of Kings College says: "What made the Mohammedan world? Trust and faith in the declarations and assurances of Mohammed. And what made the Christian world? Trust and faith in the declarations and assurances of Jesus Christ and his Apos-

ties." To this Prof. Huxley replies in substance, and with an agnostic smile of triumph: "Mohammed was a personified falsehood, and his religion is a damnable delusion, and this being so, the 'trust and faith' which have 'made the Mohammedan world' in just the same sense as they have 'made the Christian world' must be 'trust and faith' in a falsehood."

The reader will feel the force of Prof. Huxley's reply to the above assertion of England's orthodox champion, and possibly wonder where and what the trouble is. If, however, he will start and continue his inquiry in the light and on the line of true faith and true science, he will soon see that the whole jargon dispute between these two men, or rather the two distinct schools of thought which they respectively represent, is based on unsound premises, full of false philosophy and lame in all the legs of its miserable logic from beginning to end. There is a quantity not taken into consideration by either disputant, and which must be recognized as essential to the proper solution of the fundamental question around which these British bulls are pawing the dust of the arena, accompanied with their discordant notes of undulatory bellowing.

They are attempting to discuss the Christian's claim in behalf of Christ's Messiahship, the authenticity of the gospel narratives as bearing upon the question of the correctness of such claim, and the rule by which the question is to be decided as to what testimony is competent in the case. While thus engaged they remain manifestly ignorant of certain entities, elements and factors which lie deeper than all subjective "experience" on the part of Dr. Wace, and all methods practiced by Huxley's "literary critics." Just think of it! The Principal of Kings College in the leading metropolis of Christian civilization announcing at a church-congress of assembled ecclesiastical dignitaries that "faith has made the Christian world." Will Dr. Wace please tell us what made faith? We had almost fallen under the power of that rational and scriptural teaching that faith itself was a product of the heavenly powers at hand in the Christian world for just such purpose. Now we are told that "faith made the Christian world." Where, we ask again, does faith come from? From Dr. Wace's standpoint it can only be regarded as something evolved out of nature. Then, gentlemen, you have evolution in the higher realm of biology as senseless as Huxley's theory of evolving the reason of a man from the rudimentary organs of a tadpole. No wonder that in the presence of such manifest and approved reliance, in the sphere of religion, upon motion and evolution as the productive factors of the "Christian world," Prof. Tait, of Edinburgh, felt himself authorized to proceed in the same direction within the sphere of physics until he declared that "there is probably no such thing as force at all."

But to the question as to the cause of such floundering in shallow water. The difficulty lies in the world's infidelity concerning the invisible entities of being in general. It is materialism on the one hand and motionism on the other. Between these erroneous and untenable positions the learned world is making a fool of itself. And this will continue to be the case until its theologians and physicists renounce their infidel theories and begin to endure as seeing the invisible entities that

manifestly underlie all "experience," all "faith," all motion and all other phenomena in the universe of God.

Dr. Wace appears to have no more proper and adequate conception as to what is really meant by the gospel as the *power* of God than the disciples of Helmholtz have of sound as a force-entity in nature. The "declarations and assurances" of Jesus as recorded in the Bible belong to His methods of manifesting the gospel to the world, and as such are documentary parts of the "Christian world," but they are not essential elements of the gospel as to the immaterial substance thereof, any more than the vibratory action of a sound-liberating body like a violin is a part of the sound itself. [See our "Substantial Philosophy," p. 162.] It was this deficiency in his philosophy and in his "faith" that led Dr. Wace into the blunder of asserting that "faith in Christ's declarations made the Christian world." If faith makes the Christian world, then seeing makes the world of light, and hearing makes the world of sound, and it would follow in logical reasoning that the larger the ears the more intense the sound produced thereby.

There can be no proper conception of the gospel, or of the Christian world from a materialistic or a motionistic point of view. If there be not in the constitution of Christianity an objective entity—an immaterial substance—a heavenly force, which acts as "the power of God" for the accomplishment of a certain purpose in His plan of the universe, then is our preaching vain, and Dr. Wace's "faith" is also vain, no matter how many imaginary Christian worlds it may be able to make in the subjective laboratory of its miserable empiricism.

We readily admit that Christian faith in the heart of the believer, as a product, or rather a reproduction of Christ's life, is both active and productive in the life of the Christian. Otherwise it would not have been represented in the Christian scriptures as having the germ of organic power, like the mustard seed; neither would inspired authority have spoken of it as something that *works* by love. We also concede that such faith, as a reproduction of Christ's life in his regenerated children is an entity; for if it be not an entity, it could neither "work" nor "overcome the world;" yet to say with Dr. Wace that faith "made the Christian world" is simply to creep into a circular syllogism and crawl away among the convolutions of false logic. [See our "Substantial Philosophy," p. 301.]

Jesus Christ made and is still making the Christian world. It was germinally and fontally in him; and now, as the six days of the new creation are rolling by, the work of creating all things new is in the process of organic completion. As the human world is evolved from the first Adam, so the Christian world is the product of the unfolding of the life of the second Adam in the body of humanity, re-creating and transforming its assimilable parts into the body of Christ, constituting it "the fullness of Him that filleth all and in all." (Eph. 1:23). Thus the "Christian world" is not only the product of Christ's creating energy, but also the recipient, embodiment and conductor of His messianic plenitude to the whole lump of humanity. [See the "Substantial Philosophy," p. 290.]

At this point in the course of our criticisms upon antipodal errors, and our inquiry after positive and pivotal truth we reach the Sub-

stantial Philosophy, and thank God for such an oasis in the sandy desert of the world's false theories, both in the department of physics and in the higher sphere of religion. We do not say that Christianity, objectively considered, depends upon any new discovery of principles and facts in nature, or upon any system of reasoning projected by men; but we wish to be understood as distinctly affirming that the "Christian world," with all that it involves, fontally, constitutionally and operatively, can never be correctly and fully apprehended in a scientific way by any man or any association of men that will persist in remaining blind to those basic principles upon which the Substantial Philosophy is building its temple of renown for the ages to come.

Apprehended from this high standpoint the Christian world is not regarded as something made by "faith," in the sense that "faith in the declarations of Mohammed made the Mohammedan world." Out upon such

"Bookful blockheads, ignorantly read!"

Christ is the beginning of the new creation. It is in and from Him. He lives on in his Christian posterity. His life is thus perpetuated in time, and, no doubt, will be so perpetuated in eternity through his mystical body—a ransomed church. "He thus authenticates himself and all else that is true." As the sun is not discoverable in the feeble glimmerings of a tallow-dip, so the sun of righteousness can not be seen except in his own light. Shining out thus from himself, and thus authenticating himself, he lighteth every man that cometh into the "Christian world." Such illumination takes place by "the light of life." This life underlies all "gospel messages," all "faith," all "experience." The words which he spake, and which "are still echoing over human hearts," "they are spirit and they are life." That which is spirit and life is not mere motion or effect. It is substance: not material, but immaterial substance. Such substance is a living and spiritual force in the world. By its heaven-working power in humanity it is constantly reproducing itself in the form and force of faith, which is "the substance of things hoped for and the evidence of things not seen" by such men as Dr. Wace and Prof. Huxley.

Fremont, Ohio.

## VOLUME VI. HAS CLOSED.

This twelfth number of the MICROCOSM closes the present volume, and it finds us more convinced than ever before of the truth of the cardinal principles of the Substantial Philosophy, and more determined than ever before to maintain them in the face of all scientific and philosophical opposition.

Not a single number of this volume, from the first to this twelfth, but contains at least one single article alone subversive of the current motion theories of science, with facts and figures which no physicist, however learned and critical, can answer. Hence we believe that such an array of consecutive discussions in opposition to present scientific scholasticism must tend in a very pronounced degree to lengthen the borders and strengthen the stakes of our noble philosophy of Substantialism.

This continual accumulation of mechanical and mathematical considerations against the wave-theory of sound in particular and the motion-theories of science in general—a speci-



men of which our opening editorial in this number presents—must tend to convince unbiased investigators of the physical laws that there is more in the claims of Substantialism than the present leaders in science are willing to admit. But invincible as has been this array of argument, the bombardment from our substantial batteries is not to slacken in the least during the coming *Microcosmic* year.

We want every friend who sympathizes with us in this struggle for the supremacy of true science, in its relation to true religion and the evidences of a future for humanity, to stand by us and aid us financially, at least to the extent of fifty cents, while we push forward our standard through another volume.

But whether or not one single subscriber shall respond to this call, it will not matter as to the perpetuity of the *MICROCOSM*, for the good Lord has already so prospered the work of our hands and of our brain that the future of this little messenger, at least for another volume, is already abundantly assured and the money is in bank. Those, therefore, who want the journal for Vol. VII., to begin next month, Dec. 1st, will please forward fifty cents with their name and address, and if they feel sufficient interest in our work to obtain one or more persons to join them, they will kindly send such names with their subscriptions.

No man, however, need deprive himself of the *MICROCOSM* because of his inability to pay. Let any one, too poor to pay fifty cents, so write to us, with the certificate of some minister, doctor or lawyer, and we will put him or her down for the coming volume free of charge.

But while we shall be doing this, no doubt with thousands, let the rich and well-to-do act on the same principle and send in subscriptions for their poor neighbors.

1. Remember that a club of five subscribers, new or old, at one time will be credited for the volume for \$2.

2. A club of ten subscribers, new or old, at one time, \$3.50.

3. A club of twenty subscribers, new or old, at one time, \$5.

4. A club of fifty subscribers, new or old, at one time, \$10.

5. A club of one hundred subscribers, new or old, at one time, \$15. This is low-water mark. Who will scurry around a village or city and work up a list of one hundred subscribers at fifteen cents each? A local agent who could obtain this number of subscriptions at the regular rate (fifty cents) would make \$35. Try it.

EDITOR.

#### OUR LIST OF CONTRIBUTORS.

We hope during the coming volume to renew the acquaintance of some of our old contributors who have been taking a rest since the unfortunate flasco which attended the *Arena* by our giving up the business to others.

Let these friends remember that the *MICROCOSM* is now wholly our own, and though we have been too busy during the last few months with our Health-Pamphlet, in raking in the sinews of war, to make the little *MICROCOSM* as lively as it might be and must be in the future, it has nevertheless not been idle in deepening and extending the foundation-walls of the Substantial Philosophy.

Dr. Swander, whose able and rattling review of the "London prize-ring" of agnosticism and Christian know-nothingism appears on another

page, has promised to visit our readers monthly during the coming volume. Thomas Munnell, the incisive thinker and reasoner, *ditto*. Mrs. Organ, whose critical pen never falters in original thought, elegantly expressed, *ditto*. etc., etc. On the whole we believe we can promise our readers, with the aid of our contributors, fifty cents' worth of thought, or at all events ideas that will provoke thought, during the next twelve numbers of the *MICROCOSM*.

#### A VERY KIND WORD.

Our old and reliable contributor, Rev. T. Williston, of Ashland, N. Y., now eighty-five years old, and still one of the soundest theological writers and thinkers of the country, has written us a congratulatory letter concerning our Health-Pamphlet which he had not yet received, in which he makes the following very kind allusions to our life-work:

"Wilford, I am truly glad that in more ways than one God is honoring you as a benefactor of mankind and on an extensive scale. To say nothing of the fame you have acquired—and justly I have no doubt—as the founder of the Substantial Philosophy, and not to mention the good you are doing in that direction, if your hygienic treatment is the health-improving, health-prolonging discovery it is said to be by so large a number of invalid purchasers and users, why, it will not be long before your name will be gratefully mentioned in all lands and you regarded as the world-wide benefactor, not of a select few but of the entire race. Such a health restoring and life-prolonging discovery as yours is said to be can not long be kept from becoming universally known and sought for, and I venture to predict that this discovery will in the world at large do even more to perpetuate and immortalize your name than your scientific contributions, valuable as they are."

After receiving and reading the pamphlet, Mr. Williston writes, closing his letter in these words:

"Though I am neither a prophet nor the son of a prophet, I venture the prediction that down to the very end of time Hall's mode of improving health and prolonging life will be everywhere known and successfully employed. This may now seem highly extravagant language, but Williston will risk his reputation as a guesser on the verification of his words. Wilford Hall is worthy of one new title—W. B.,—the *World's Benefactor*."

Thanks, dear old friend; thanks.

#### BISHOP PIERCE OF ARKANSAS.

We had the pleasure of a very pleasant call the other day from the Right Rev. H. N. Pierce, Bishop of the Protestant Episcopal Church of the Diocese of Arkansas, and we had a most enjoyable conversation with him upon the various phases and bearings of the Substantial Philosophy, a subject with which he is entirely familiar, having been for some time a reader of the *MICROCOSM* and of the "Problem of Human Life."

We were no less surprised than delighted to find the bishop one of the most critical opponents of the prevailing motion-theories of science with whom we have ever conversed. Wave-theorists should steer clear of his critical and masterly intellect if they do not wish to be stranded high and dry, as his powers of sar-

casm against the nonsensical bombardment of molecules in the present theories of sound, heat, light, etc., are simply multitudinous.

If all the bishops and clergy of the Episcopal Church were as bright and as well posted in the self-contradictions of modern materialistic science and the availability of Substantialism as Bishop Pierce, atheistic agnosticism would soon go limping from the field.

We were also glad to learn from the bishop that Mrs. Pierce is taking an active interest in spreading a knowledge of our Health-Pamphlet in Little Rock and vicinity, having herself received great benefit from the treatment.

#### THE NOVELTY OF OUR HEALTH-TREATMENT.

BY THE EDITOR.

As set forth elaborately in the September MICROCOSM, our health-treatment as a radical and heroic system of vital reconstruction, was entirely unknown to therapeutical, pathological and physiological science at the time of our claimed discovery and for many years thereafter.

As stated in that defense of our claim to the originality of the discovery, we admitted the fact that many doctors in different parts of the United States have more recently come into possession of the discovery and have been using it in their practice with very marked success in the cure of disease. The way in which this discovery has thus become known to so many physicians, we made very plain in our September article referred to. In a word it was on this wise:

Dr. R. F. Stevens, of Syracuse, N. Y., to whom we revealed the entire process with its pathological and therapeutical rationale more than twenty years ago, and twenty years after we had first applied it to ourselves, was at once so struck with its importance, that he prepared and read a set paper before a learned society of medical gentlemen in that city, and in which he explained the discovery in its principal details and its physiological effects. (See Sept. MICROCOSM, which will be sent free to any one desiring to know all about the origin and history of this treatment.)

As a matter of course from that single publicity it gradually spread in conversation and correspondence to other doctors, most of whom, however, repudiated the discovery on account of its novelty, as did the entire medical society to whom Dr. Stevens first presented it, though a few here and there saw its reasonableness and put it into practice with their patients.

This novel treatment at once proved so effectual as a drugless preventive and cure of disease, that the fortunate professional finder of the simple and costless remedy commenced to devise means for keeping the secret from his patients while still giving them its benefits and his own pocket the advantages of professional attendance, which in nine cases out of ten would have been utterly wiped out had the innocent patient fully comprehended the rationale of the new remedy.

Intuitively the adroit doctor conceived the ruse of making application of the treatment in connection with some harmless drugs, thus to obscure the evident effectiveness of the process itself, and thereby to make the patient believe that the diseased condition had been met primarily by the medicine which had been adminis-

tered merely as a blind, and which in fact as a rule did neither good nor harm. We know whereof we speak in this matter by the written acknowledgments of more than one who have adopted and proposed to adopt this plan of protecting the secret of the remedy.

But notwithstanding the fact as here stated in regard to the public lecture of Dr. Stevens, thus making known our discovery more than twenty years ago, a few doctors who have thus learned of the treatment, and who have been using it for less than a dozen years, almost insolently pretend to deny our right to its origination, even with the positive proofs of our practice of the discovery in our own person for more than forty years.

This phase of the discussion, however, is unimportant with us as compared with the intrinsic value of the treatment itself. Of this we have the most indubitable proofs even from the very doctors who have incidentally learned of it through the lecture of Dr. Stevens referred to, and who have been using the treatment with their patients for several years past.

One of these physicians—an eminent practitioner in the State of Indiana, whose name we are not authorized to quote, writes to Dr. Huestis, of Columbus, Ohio, and unequivocally indorses our treatment after sending for the pamphlet, and learning its details. He says:

"However, the method is not new to me, having used it now for more than eight years,—certainly long enough to regard it with a degree of respect *higher than that of any other therapeutic measure in the realm of curative medicine.*"

He also states in his letter to Dr. Huestis, as quoted by the latter in a letter to us of Oct. 16th, that an eminent practitioner in Chicago whom he met in a consultation, has used the same treatment for ten years and that "*he told me of over two thousand tabulated cases of persons cured by this process.*"

We will only add that the eminent physician quoted by Dr. Huestis, though having used our treatment for more than eight years does not hesitate, after seeing the proofs of our original claims to the discovery as set forth in the September MICROCOSM, to acknowledge our moral and just right to the credit of the treatment.

#### OUR OFFER TO THE POOR.

A doctor out west whose name we withhold, though he is an enthusiastic admirer of our Health-Pamphlet, writes:

"Dr. Hall,—Take back your offer to give pamphlets to the poor who may not be able to raise the \$4. There are hundreds who will take advantage of your generosity to 'do' you every time. It is my opinion from a long experience as resident physician at a charity hospital, that if you continue that offer in the MICROCOSM you will give away more of your Health-Pamphlets than you will ever sell. A man who has not the enterprise and the desire to live in the enjoyment of good health sufficient to earn, beg, or borrow from personal friends four dollars by which to possess himself of this treasure of knowledge, would not have energy enough to put the treatment into practice after you should give him the book. Instead of giving away pamphlets you had better raise the price to \$50. It is well worth it, and you richly deserve such remuneration for your discovery."

Now, with all respect to this friendly advice, we can not think of taking it. Our offer stands precisely as stated last month and on the conditions named. We have the positive evidence before us that persons who have already made application for pamphlets under this offer, with certificates from their postmasters as to their inability to raise \$4, are strictly honest, worthy, and deserving of charity. We have never received cash for pamphlets with half the gratification that we have felt when mailing them under seal to the parties just named in the care of their postmasters. Let a thousand such deserving subjects send in their applications duly vouched for, and the little books will be forthcoming. The paper-makers, printers, and binders want work, and this will help them. The following is our offer as it appeared last month:

#### OUR HEALTH-PAMPHLET FREE TO THE POOR.

Enemies of our work have accused us of mercenary motives in selling our Health-Pamphlet at \$4, when, as they insist, there are hundreds of poor and sick families who are not able to raise this sum under any possible circumstances, yet whose health and comfort might be restored could they have the benefits of this treatment.

To meet this charge, we now propose that any family who would not be able to procure drugs to the amount of \$4 if prescribed by their doctor, and who will get their nearest postmaster, after showing him this notice, to certify to the fact of such inability, we will send a pamphlet to such family free of charge in the care of the postmaster on receiving a written promise not to divulge the treatment or show the pamphlet outside of said household.

Those, on the contrary, who are able to pay for drugs which invariably leave the system the worse for their use, whatever temporary relief they may afford, should not object to paying for this drugless prescription, which will not only serve them for a lifetime, but will make that lifetime much longer and much more enjoyable.

#### OUR PRIZE-ESSAY CONTEST.

This interesting competition for literary and logical supremacy has now closed with the sixth volume of the MICROCOSM. We have printed during the year 23 essays, all excellent in different aspects. Many of the writers, in their anxiety to elaborate their ideas, have overreached the limits of space prescribed at the start—a single page of solid brevity, or 1,200 words. Others have even abbreviated with a view of keeping safely and rigidly within the limits named. On the whole the intellectual showing has been very good, and much substantial thinking has been accomplished in these 23 essays.

The judges—Rev. Dr. James A. Buck, of Washington City; Dr. Henry A. Mott, Ph.D., LL.D., and Prof. Henry S. Schell, A.M., of this city, are the umpires who are to decide the merits of the various Essays and award the three cash prizes (\$30, \$20 and \$10) to the three successful contestants. This decision will be announced next month—No. 1, Vol. VII.—and the prizes will immediately be forwarded in cash to the successful competitors.

Next year a similar list of cash-prizes will be offered on the same conditions. See the

original announcement in No. 1 of this volume, which will be sent on application.

Let no one who misses a prize this time—as only three can possibly win—become soured for any imaginable reason, but rather be spurred to energetic effort for original and well matured ideas in the next annual competition. Remember that each contestant will be entitled to two trials, and should aim as much as possible for original thoughts, or at least for thoughts expressed in an original manner.

A few prize-essays were sent in too late for this volume, as only a limited number can go into a single issue. Such late articles will have to take their chances after examination in the new contest for Vol. VII. We hope that each contestant will strictly observe the limit of 1,200 words, though articles may be only half that length, or even shorter.—EDITOR.

#### OUR EXTRA MICROCOSM SENT FREE.

Any person who may desire to read up on the new treatment for disease without medicine, should send for a copy of our *Extra*. It contains our leading editorials, prefatory and introductory to this discovery, and, aside from the Health-Pamphlet, is full of desirable information to the general reader.

An edition of this *Extra* has been prepared for the use of local agents, in which our own address has been carefully removed from all parts of the paper. By this precaution an agent who goes to the trouble and expense of circulating the *Extra* among the afflicted will receive the benefit of his own labor by thus directing all orders for the pamphlet to himself. Of course he will write or stamp his own name and address on the margin of the *Extras* he shall distribute. Sent in quantities at one cent per copy, to cover postage. Sample copy free to any address.

We have also printed a large circular or poster for the use of local agents, without any reference to our own address. It is a most telling document to attract the attention of one who may see it, containing as it does in plain type a powerful array of the best testimonials. Price, 50 cents per 100 copies, post paid. Sample copy free.

#### A GOOD IDEA SUGGESTED.

Rev. Dr. H. Lyman, of Courtland, N. Y., became so thoroughly convinced of the value of our Health-Pamphlet to the afflicted, that he wrote a dozen postal cards to distant friends calling their attention to the treatment and notifying them that the "Extra" MICROCOSM would accompany this card, and requesting a careful perusal of the same. He then mailed all these written cards in a package to us, to be mailed from New York simultaneously with our "Extra," which we have gladly done.

Now the point we wish to make is this: Hundreds of our subscribers can do the same as did Dr. Lyman, and in return for such favors we will cheerfully remit to the writers cash for all expenses, including postage, postal cards, &c. EDITOR.

Remember, the next, or Seventh Volume of the MICROCOSM, like the present, begins with December number instead of January. Some have supposed that the volume necessarily begins with the year. This is a mistake. Please make a note of it.



## AN EXCELLENT LETTER.

The Rev. Dr. James A. Buck, Rector of St. Paul's Episcopal Church and Chaplain of the Soldiers' Home, Washington, D. C., has addressed a fraternal letter to the bishops and clergy of the church throughout the United States and Territories, earnestly calling their attention to the necessity of becoming acquainted with the Substantial Philosophy, and of utilizing its principles in meeting the prevailing tendency toward religious skepticism.

The doctor refers the clergy to the powerful address of Bishop Whipple, of Minnesota, in the recent Triennial Convention at the City of New York, in which he deplores the tendency of the times toward materialistic infidelity, and suggests that the clergy should avail themselves of every scientific and philosophical help within their reach to counteract this rapidly-growing evil.

Dr. Buck's letter makes a strong appeal in favor of Substantialism as altogether the most available means at present known of meeting this tendency of the times, and recommends the reading of the MICROCOSM by every defender of the cause of religion.

This interesting letter will appear in the next number of the MICROCOSM—the first issue of Vol. VII.

## OUR SPECIAL OFFER TO CLERGYMEN.

[From Sept. MICROCOSM.]

We have so much faith in the intrinsic merits of our Health-Pamphlet and the treatment unfolded therein, that we now propose to any clergyman who will order it at the regular price (\$4), and who will give the treatment a faithful test for one month, that if not satisfactory he shall have the privilege of returning the pamphlet and receiving his \$4 by return mail, without any reduction for our trouble and expense. This surely ought to satisfy the most skeptical and wavering.

But it is understood that such minister must not only agree when ordering the pamphlet not to show it or reveal its contents outside of his own family, but must, if he returns it, send a like written promise never afterward to use the treatment or permit it to be used by his family.

Let no one hereafter say that we wish to obtain money from the purchasers of this pamphlet without giving full value for the same. Respectfully,

A. WILFORD HALL,  
23 Park Row, New York.

## OUR SCIENTIFIC LIBRARY OF SUBSTANTIALISM.

This library now consists of ten volumes bound in cloth, namely—six volumes of MICROCOSM, including present volume VI—\$8.50. Two volumes *Scientific Arena*, \$2. *Problem of Human Life*, \$2. Text book on Sound, 50 cents—\$13. All these books for a limited time will be sent by express for \$6. Or by mail prepaid, \$7.50.

This library contains all our scientific and philosophical writings up to the close of this volume of the MICROCOSM. Those who are interested in obtaining a knowledge of the Substantial Philosophy should not fail to take advantage of this unprecedented offer to add these volumes to their libraries.

## REV. MR. OGLESBY'S CONTRIBUTION.

We have in type Mr. Oglesby's third contribution on the nature of money, with our remarks in reply. At the last moment it was found necessary to carry the whole discussion over to No. 1, Vol. VII., owing to the numerous matters necessary to go into this closing number of this volume. That final essay on the money question is very racy, and will interest the reader. Look out for it.

## SEVEN M.D.S BEAUTIFULLY TRAPPED.

This interesting feat was adroitly accomplished in last Sunday's *New York World* (October 27th), by the intrepid lady reporter and detective, Miss Nelly Bly, employed on that paper. She played sick and visited the seven prominent doctors, probably with a made-up sallow complexion, and thus obtained from each a critical diagnosis of her case, for which they charged her \$5 to \$10, one only charging less than \$5.

Now comes the funny, and at the same time serious, part of this exposure. Each of the seven learned physicians solemnly attributed to her a different ailment, and then each as gravely prescribed a different class of medicines, including tincture of nux vomica, muriatic acid, digitalis, arsenious acid, bi-sulphate of quinine, phenacetine, bromide of potash, sulphate of magnesia, muriatic acid, iodide of potash, exalgine, elixir cinchona bark, etc.

The individual names and street numbers of the entire seven, with their prescriptions in *fac simile*, are given in the *World*. A more humiliating exposure of the humbug and empiricism of this professional business of dealing out poisons to the sick at \$5 for two dozen words of latin quail-tracks on a slip of paper, has never before been placed on record. Let those of our readers who doubt send five cents in stamps to the *New York World* for a copy of that paper. If that single exposure does not lose the doctors of New York in prescription receipts alone a cool million dollars, and save the gullible people a like amount, then we sadly miss our guess.

## AN INCIDENTAL INDORSEMENT.

We like incidental indorsements of our work, especially as they occur in newspaper correspondence with which we have no connection, because every one knows that no personal flattery is intended. A number of these incidental allusions have recently occurred, and we quote one as a sample, from the *Apostolic Guide*, Sept. 27th, which appears in a letter of L. A. Cutler, their regular field correspondent:

"Came to Louisa, C. H., Monday afternoon, and stopped over to see my dear mother, now seventy-seven years old, and my sister and brother. P. H. Cutler takes and reads the *Microcosm*, thinks that A. Wilford Hall is the brainiest man in the world, has placed himself under Hall's 'treatment,' in which no medicine is used; says that he is cured of the catarrh, almost cured of kidney trouble, never intends taking another dose of medicine, and never expects to be sick again. My sister, also trying the treatment, thinks that she is improving. My brother's faith in Hall is sublime; you ought to hear him talk. I went home Tuesday, left this morning, and am aboard the *Ariel* for Norfolk."

In writing on business connected with the MICROCOSM, our Scientific Library or our Health-Pamphlet, make your letters as short as possible to convey the essential ideas intended. Address all communications, A. WILFORD HALL, 23 Park Row, New York.

**LITERARY PALÆONTOLOGY.****A new word-building puzzle.**

[Copyright Secured.]

We have invented a new word-constructing puzzle as a test of intellectual genius. It consists in figuring out and filling up a sentence which may have lost some of the letters composing its different words,—as for example take the following:

"Time will not allow of a fuller explanation."

Let us suppose that by accident, in printing the MICROCOSM, certain letters unobserved have dropped from the above sentence, leaving it when printed thus:

"imew l ot ll w faf l rexpl at n."

Of course the readers of our journal are puzzled to make out the sentence, and will succeed or not in proportion to their literary ability and their grasp of the proper construction of the language.

This problem is somewhat analogous to that of the skilled comparative anatomist in his palæontological researches, figuring out the true specific form of an extinct race of animals from a few scattering bones he may chance to have discovered. Hence we have named this art of reconstructing a sentence from a few fragmentary letters,—"*Literary Palæontology*."

The following paragraph, supposed to have been marred in the manner described above, is given as a test:

No e er ro f f e l l t a y e i s c a b e  
a s k e h a f r n e o b e a l e t o o r e a s t n d  
w o k o t r o m h e f r g m t a y n d s e l t o n -  
l e t r s o f o d s , t h c o l e e t h g h a d i m  
o f h e r i r . I t i k e e a n g e w e n h e  
l i e s .

Let each reader of the MICROCOSM now try to fill up this fragmentary paragraph just as it was when complete, or before the letters had dropped out.

Remember that the letters in this skeleton paragraph are in their exact relative positions and distances apart, the missing letters having simply been removed from the words, and their places supplied by spaces of the same size.

We now propose to send by mail a beautiful bound copy of this volume of the MICROCOSM to each subscriber who will figure out without assistance and send us the above paragraph properly filled out, by the first day of December proximo.

Of course the paragraph, with its lost letters restored, will be printed next month when the reader, now puzzled, will see how easily it is done.

EDITOR.

P. S. After constructing the above skeleton sentence we tested it with a number of literary experts and found that while some regarded it as utterly insolvable and became discouraged, others made fair headway toward its solution, and one solved it in less than thirty minutes, proving that complete success could be attained by almost any bright intellect with sufficient perseverance.

The beauty of this class of puzzles is their endless variability. It is plain that they can easily be made so intricate by the abstraction of letters as to be totally insolvable by any one, even with years of study, while it is equally evident on the other hand that they can be made so simple and easy that a child could fill out the appropriate missing letters at a glance, as witness the following sentence:

"No p r o n , h v i g t e f l l p s s s o n o f  
h s f c l t s , e v r w s s o w a t h y a s n t t o  
d s r e g e t r r c h s ."

We leave this very simple skeleton-sentence unsolved to initiate our younger readers into this beautiful art of *Literary Palæontology* and thus educate them into the habit of close thinking.

The same general principle of word-building will apply to the filling out of sentences which, for example, may have lost alternate words. Take as an illustration the following skeleton-sentence, and without looking at the solution immediately to follow, first try to fill in the appropriate words:

"Whoever           succeed   improving  
knowledge,       only       take       of  
own               of           and  
genius,       must       by       experience  
mistakes   others."

This fragmentary sentence when filled out reads thus:

"Whoever would succeed in improving his knowledge, not only must take advantage of his own resources of originality and inventive genius, but must profit by the experience and mistakes of others."

How difficult, yet how simple and easy, after it is once found out!

As this puzzle is highly educational in its tendency, as well as highly entertaining to the cultivated family circle, we purpose to make it one of the original features of the coming volume of the MICROCOSM. Next month we will present a problem similar to the one given above as a *test*, and will send \$1 in cash to each subscriber who will solve it without assistance.

# WHAT THE PEOPLE SAY CONCERNING OUR HEALTH-PAMPHLET.

Out of more than one-thousand volunteer-indorsements, we have only room this month for the following:

The distinguished pulpit orator and evangelist, Rev. Miles Grant, Boston, Mass., writes, October 7th:

"\*\*\* Touching your wonderful discovery I take much pleasure in saying, I am delighted with its effects upon my system. I sent for it that I might know its influence on a healthy person. I have now used it about three months, and intend to continue its use during my mortal life. The treatment produces a general refreshing invigorating effect,—sharpens my appetite, sweetens my sleep and makes me feel as though I had a new lease of life. I have persuaded several of my brethren of the ministry to send for your Health-Pamphlet, and so far as I have heard from them they are exceedingly pleased. One of them said to me a few days ago, 'I would not take \$50 for it.—It knocks the bottom out of disease.' I can say for myself I never spent \$4 to better advantage than when I bought your pamphlet. Your brother in Christ, Miles Grant."

[This indorsement appeared in a small portion of last month's edition. And we add that so impressed was Dr. Grant with the value of the discovery that on starting to Europe a few days ago, he sent his check for 50 copies of the Health-Pamphlet to distribute among his friends in England.]

S. N. Shouse, Copperas Grove, Tex., writes:

"Dear Doctor,—\*\*\* I have been treating myself with your remedy a little over two months, and with the most complete success. I have been an intense sufferer for nearly thirty years with the asthma, and for four or five years with disease of the kidneys. The asthma has entirely left me, and the pains in my kidneys are very much relieved. But what is best of all, and a sure indication that I will soon be entirely restored, is the fact that my energy and vitality are so increased that I can labor all day without fatigue. Doctor, you can depend upon it that I shall always feel very grateful to you for having called my attention through the Microcosm to this discovery. Yours sincerely, S. N. Shouse."

Three weeks later Mr. Shouse writes:

"The longer I use your treatment the better I am pleased with it. The fact that it has restored my youthful vigor is a perfect marvel to me. Indeed it is something of which I have not dreamed. \*\*\* Gratefully your friend, S. N. Shouse."

C. M. Jones, Lake City, Mo., writes, Sept. 2:

"Dear Dr. Hall,—I received your Health-Pamphlet about six weeks ago, and have been using your treatment as prescribed regularly since. I want to say through the Microcosm, for the good of suffering humanity, that from my own experience I have no language in which to express my profound appreciation of the merits of that treatment for the radical cure of disease and preservation of health. I have been a sufferer for ten years with dyspepsia, headaches, constipation, and with the entire train of evils which attend these disorders, all of which have left me, as I trust, never to return. I never made such an investment before as when I sent you four dollars for your little pamphlet which reveals the secret of how to get well and keep well without drugs; and I solemnly aver that I would not give the knowledge I have derived from that diminutive book for all the knowledge concerning drug-medication contained in all the medical works under the sun. You can print this as my unflattering conviction of the value of your discovery. Gratefully, C. M. Jones."

Rev. R. W. Bland, Oak Park, Ill., writes, Sept. 21st:

"Dr. A. Wilford Hall,—I have used your treatment three weeks with the following results. For the first five days with such want of success as partially to weaken my faith in its efficacy, and to such extent that the subsequent marvelous results could not be ascribed in any degree to mind-cure. Though I have the appearance of good health to my friends, I have been a life-long semi-invalid suffering from catarrh, dyspepsia and resultant debility, so as greatly to curtail my working power. After the fifth day's practice of your treatment my appetite returned and was like that of a healthy school-boy; my dyspepsia disappeared, and I found I could eat promiscuously without discomfort. I slept sounder and much longer than before, while my powers both physical and intellectual were doubled. I can now apply myself to literary work fully twice the number of hours in a day; all my former feeling of weariness

has vanished. I believe your system of treatment is as sure to extinguish dyspepsia as that water will put out fire. My catarrh and general debility have left me, by better nutrition and by purification of the blood as you so clearly teach in your pamphlet. \*\*\* I am a perfect stranger to you, and this communication is entirely unsolicited; you are at liberty to print it as my candid judgment concerning the merits of your treatment. The price (\$4) is as nothing compared to the value of your pamphlet. Most sincerely yours, R. W. Bland, Pastor, M. E. Church."

John B. Hughes, Earnest, Tenn., writes, "Mr. A. Wilford Hall,—I have been regularly using your remedy ever since I received the Health-Pamphlet some weeks ago, since which time I have not taken one dose of medicine of any kind. Previously I was obliged to take pills of calomel and quinine regularly every week, until I was so fortunate as to learn about your treatment. Although I knew intuitively that every dose of medicine a person takes must wear away that much of his life, whatever temporary relief it may afford, still I had to do it, not knowing anything of your wonderful discovery till within a very few weeks past. Now, thanks to a favorable combination of circumstances, I know better, and hence, I say good-by to drug-medication from this on. Truly yours, John B. Hughes."

Rev. Chas. H. Otken, L. L. D., President of the Lea Female College, Summit, Miss., prominent Baptist Minister, Master Mason, etc., writes, Oct. 12th:

"Dr. A. Wilford Hall,—I am decidedly pleased with your health-preserving treatment, and am thoroughly satisfied of its great value to the afflicted. \*\*\* Yours very truly, Chas. H. Otken."

Rev. J. A. Davis, Democracy, Ohio, one of the oldest Baptist Ministers in the country, writes Oct. 9th:

"My dear Bro. Hall,—I am of the opinion you have made a mistake in the Oct. Microcosm, in your offer to the poor, in consequence of the growling of the enemies of your work. I fear you will be overrun with applications for your pamphlet out of a false plea of inability to pay, till you will become bankrupt in your grand enterprises. \*\*\* Dr. Conley of this village will send in a few days for your Health-Pamphlet. He is one of my converts to your teaching. Instead of doing all the giving to the poor yourself, you should call for a fund from the wealthy by which the deserving poor can be supplied with your invaluable treatment, at least at such price as to cover your expenses in keeping up the supply. \*\*\* Sincerely yours, J. A. Davis."

[Brother Davis, old and experienced as he is, does not seem to realize what an up-hill job it would be to influence the wealthy to furnish the poor with this simple means of restoring and preserving their health. It would cost us more in time, paper and printer's ink, to work up such an influence than to give a thousand pamphlets out of our own pocket. We prefer the simpler course; so let the deserving poor continue these applications as we propose in the October number.—EDITOR.]

Mrs. Rev. C. Clark, Thiells, N. Y., writes, Oct. 9th:

"Dear Dr. Hall,—Some three months ago I purchased your Health Pamphlet with many misgivings as to its value. But having been a great sufferer, or twelve months with spinal weakness, rheumatism, nervous prostration and coincidentally with a strong tendency to Bright's disease, accompanied by insomnia so that I had to walk the floor for hours at night before being able to get any rest, being at the same time under the treatment of a good physician, but without avail, it at last induced me to make a thorough application of your treatment. At once my sleep returned as of old, and as sound and sweet as ever, and my nervousness and other troubles have left me. I attribute my bodily condition to my critical period of life, and I am anxious that other like sufferers should know about my case, and secure your pamphlet. I cannot be over thankful to you for this discovery, and would not part with the knowledge thus purchased for \$4, for many hundred times that amount. Gratefully yours, Mrs. Rev. C. Clark."

More than one thousand similar volunteer indorsements are lying before us, from which we took the first eight we chanced to open, as above. No one dares to dispute these testimonials.—Editor.